

JVC

SERVICE MANUAL

Hi-Fi STEREO VIDEO CASSETTE RECORDER

BR-6600E



SPECIFICATIONS

Format	: VHS PAL standard	Sync input	: 4 +0/-3 Vp-p, 75 ohms, unbalanced
Tape width	: 12.65 mm (1/2 inch)	Sync select	: VIDEO/EXT/TBC
Tape speed	: 23.39 mm/s	AUDIO	
Recording & Playback time	: 240 min. with JVC E-240 video cassette tape	Input (line)	: -6 dBs, 10 k-ohms, unbalanced
Operating temperature	: 5°C to 40°C	(Mic)	: -70 to -60 dBs, 600 ohms, unbalanced
Storage temperature	: -20°C to 60°C	(TV)	: -20 dBs, 10 k-ohms, unbalanced
Operating humidity	: Less than 80 %	Output level (line)	: -6 dBs, into 1 k-ohms, unbalanced (Normal, Hi-Fi)
Power consumption	: 70 watts (80 watts with remote control unit. DC 12 V, 550 mA)	(monitor) (TV)	: 0 dBs, low impedance (Normal, Hi-Fi)
Power requirement	: AC 100/120/220/240 V~, 50/60 Hz	(headphones)	: Max. -25 dBs, 8 ohms, variable
Dimensions	: 440 mm(W) x 174 mm(H) x 455 mm(D) (Excluding protrusions)	Signal-to-noise ratio	: 48 dB (NR-on), 43 dB (NR-off) at 3 % distortion
Weight	: 18.5 kg	Dynamic range	: 85 dB (Hi-Fi)
Fast forward/Rewind time	: Less than 4.5 min. for 180 min. tape	Frequency response	: 40 to 12,000 Hz (Normal), 20 to 20,000 Hz (Hi-Fi)
Search speed	: Shuttle FWD/REV ±10X Variable 0 to ±5X, ±10X	Wow and flutter	: Less than 0.15 % wrms (Normal) Less than 0.005 % wrms (Hi-Fi)
VIDEO		CONNECTORS	
Recording and Playback system	: Rotary two-head, helical scanning system Luminance: FM recording	Video input/output	: BNC-type connectors
Video signal system	: PAL-type colour signal (EIA standard)	sync input	: BNC-type connector
Input (line/monitor)	: 0.5 to 2.0 Vp-p, 75 ohms, unbalanced	Audio	: RCA-type pin connectors
Output (line/monitor) dubbing	: 1.0 Vp-p, 75 ohms, unbalanced	Hi-Fi input/output	: RCA-type pin connectors
Signal-to-noise ratio	: Y-629, 7-pin	Normal input/output	: 6-mm jack
Horizontal resolution	: 45 dB (Rohde and Schwartz noise meter) 250 lines (Colour) 300 lines (B/W)	Microphones	: 6-mm jack
		Headphones	: 45-pin and 8-pin connectors
		Remote control	: 3-lead AC connector
		AC in	
		Accessories	: Monitor cable

Design and specifications subject to change without notice.

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the  symbol and shaded (■) parts are critical for safety.

Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.

Caution for continued protection against fire hazard.

Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:

- 1) Wires covered with PVC tubing
- 2) Double insulated wires
- 3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:

- | | | |
|--------------------|--------------------------------------|------------|
| 1) Insulation Tape | 3) Spacers | 5) Barrier |
| 2) PVC tubing | 4) Insulation sheets for transistors | |

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

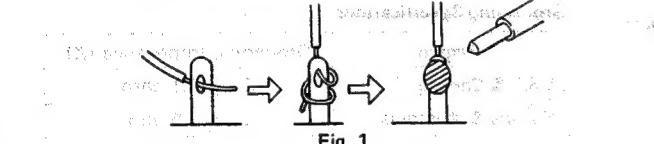


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

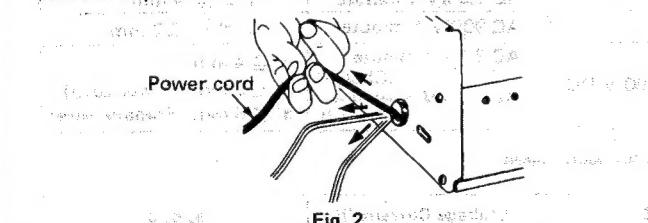


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)

In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector

In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

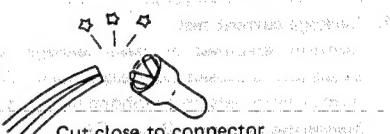
1) Connector part number : E03830-001

2) Required tool : Connector crimping tool of the proper type which will not damage insulated parts.

3) Replacement procedure

(1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).



Cut close to connector

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

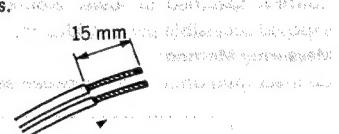


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

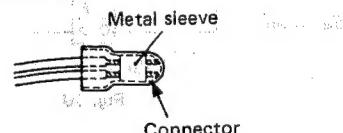


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

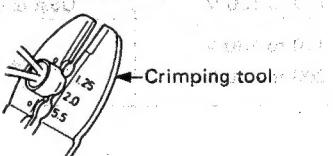


Fig. 6

(5) Check the four points noted in Fig. 7.

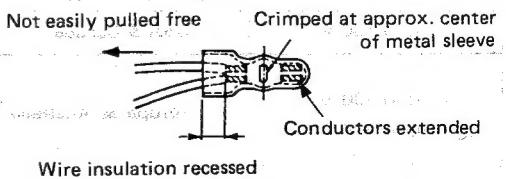


Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

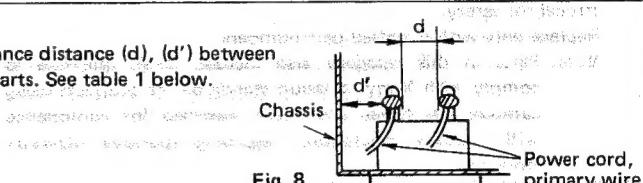


Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts.

Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

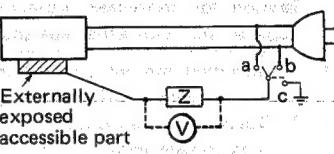


Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

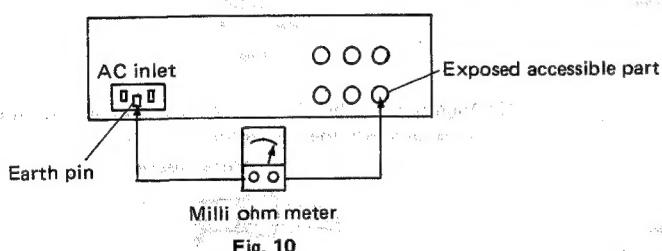


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	$R \geq 1 \text{ M}\Omega / 500 \text{ V DC}$	AC 1 kV 1 minute	$d, d' \geq 3 \text{ mm}$
100 to 240 V			AC 1.5 kV 1 minute	$d, d' \geq 4 \text{ mm}$
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	$d, d' \geq 3.2 \text{ mm}$
110 to 130 V 200 to 240 V	Europe & Australia	$R \geq 10 \text{ M}\Omega / 500 \text{ V DC}$	AC 3 kV 1 minute (Class II)	$d \geq 4 \text{ mm}$
220 to 240 V			AC 1.5 kV 1 minute (Class I)	$d \geq 8 \text{ mm} \text{ (Power cord)}$ $d \geq 6 \text{ mm} \text{ (Primary wire)}$

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$0 - 1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V		$0.15 \mu\text{F} - 1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	$0 - 2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
220 to 240 V		$0 - 50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

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BR-6600E

INSTRUCTIONS

For reference, the text of the instruction booklet of this model is reproduced in the following pages.

Numbering of the pages also corresponds with that of the booklet.

**Warning Notice
FOR YOUR SAFETY (Australia)**

1. Insert this plug only into effectively earthed three-pin power outlet.
2. If any doubt exists regarding the earthing, consult a qualified electrician.
3. Extension cord, if used, must be three-core correctly wired.

**IMPORTANT (In the United Kingdom)
Mains Supply (AC 240 V~, 50 Hz only)
WARNING – THIS APPARATUS
MUST BE EARTED**

The wires in this mains lead are coloured in accordance with the following code:

GREEN-and-YELLOW:	EARTH
BLUE:	NEUTRAL
BROWN:	LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows. The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked with the letter E or by the safety earth symbol $\frac{1}{2}$ or coloured GREEN or GREEN-AND-YELLOW. The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or which is coloured BLACK. The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

POWER SYSTEM

Connection to the mains supply

The operating voltage of this set is preset to 240 V~ at the factory.

Before connecting to mains, check that the voltage selector on the rear panel is set to the same voltage as your local mains supply.

Adapting to local power line

This set operates on either 100, 120, 220 or 240 V~.

If the preset voltage is different from the power line voltage in your area, reset the voltage selector by inserting a screwdriver into the slot of the voltage selector and turning it until the correct voltage is displayed.

This equipment has been produced to comply with Directive number 82/499/EEC.

**WARNING:
TO PREVENT FIRE OR SHOCK
HAZARD, DO NOT EXPOSE THIS
APPLIANCE TO RAIN OR MOISTURE.**

CAUTION

To prevent electric shock, do not open the cabinet. No user serviceable parts inside. Refer servicing to qualified service personnel.

Note: The rating plate and the safety caution are on the rear of the unit.

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Only cassettes marked "VHS" can be used with this video cassette recorder.

PRECAUTIONS

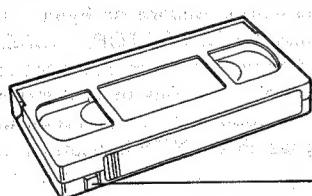
FEATURES

Handling and storage

- Avoid using the recorder under the following conditions:
 - extremely hot, cold or humid places,
 - dusty places,
 - near appliances generating strong magnetic fields,
 - places subject to vibrations, and
 - poorly ventilated places.
- Be careful of moisture condensation.
Avoid using the recorder immediately after moving it from a cold place to a warm place or soon after heating a room which was cold. The water vapour in warm air will condense on the still-cold video head drum and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully.
 - Do not block the ventilation openings.
 - Do not place anything heavy on the recorder.
 - Do not place anything which might spill and cause trouble on the top cover of the recorder.
 - Use in horizontal (flat) position only.
- In case of transportation,
 - Avoid violent shocks to the recorder during packing and transportation.
 - Before packing, be sure to remove the cassette from the recorder.

Video cassettes

- The BR-6600E employs VHS-type cassettes only. E-240 for 240 minutes, E-180 for 180 minutes, E-120 for 120 minutes, E-90 for 90 minutes, E-60 for 60 minutes and E-30 for 30 minutes of recording.
- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



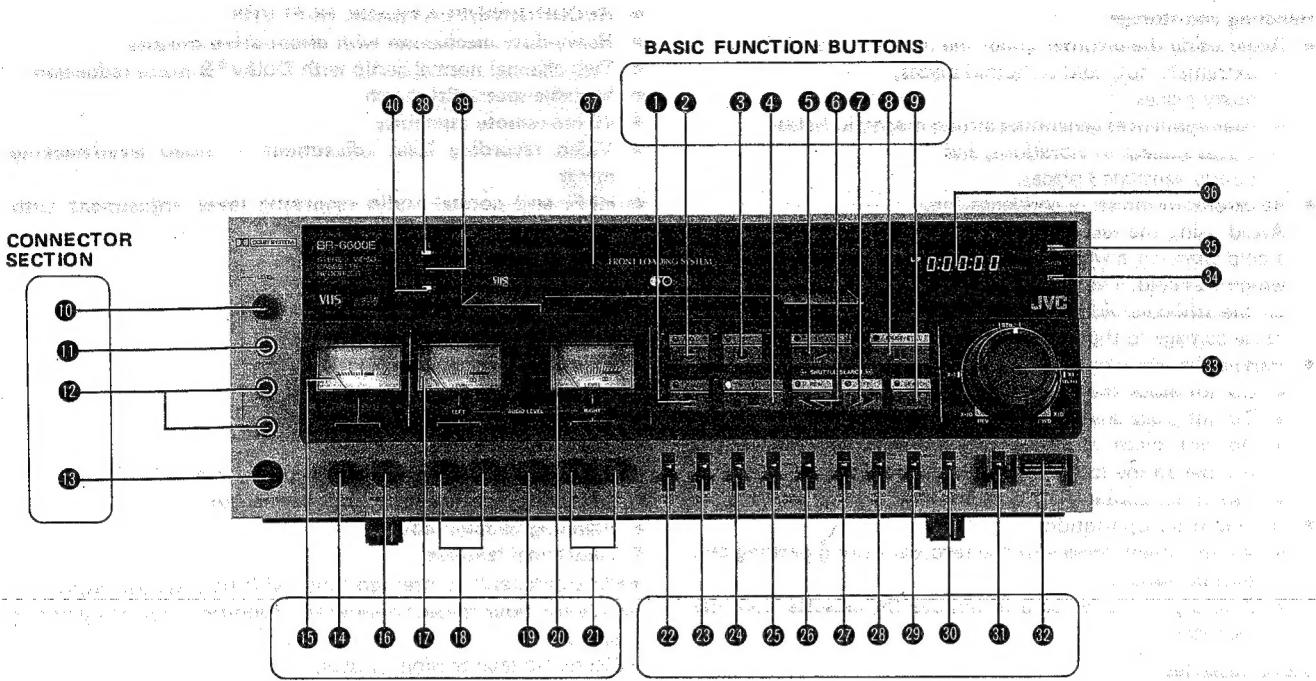
Safety tab

- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in cassette cases and position vertically.

- RECORDING/PLAYBACK Hi-Fi VHS
- Heavy-duty mechanism with direct-drive motors
- Two-channel normal audio with Dolby*^D noise reduction
- Variable-speed dial search
- 45-Pin remote capability
- Video recording level adjustment — video level/tracking meter
- Hi-Fi and normal audio recording level adjustment with meter
- Headphones level control
- Audio limiter switch
- Video AGC ON/OFF switch
- Frame servo ON/OFF switch
- External sync capable
- Repeat playback (B-E, B-000, 000-E)
- Timer recording with external timer
- Audio dub capable (ch-2 only)
- 8-pin monitor TV connector on the rear panel
- RM-P53U remote control unit connector
- Blanking switcher built-in
- Additional features
 - Electronic tape counter/lap timer with fluorescent display.
 - External hour meter to show the running total of operating hours.
 - Electronic tape tension control.
- Condensation detector and built-in condensation prevention heater.
- Warning indicator for any malfunction related to tape transport or condensation.
- BNC video and RCA audio connectors
- Front panel connectors for two microphones and a set of stereo headphones.

*Dolby and double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

CONTROLS AND CONNECTORS



BASIC FUNCTION BUTTONS

① EJECT button

Press to eject the cassette. This button can be pressed in the Stop mode or immediately after the STOP button has been pressed. The EJECT Indicator will flash during automatic unloading of the cassette and then remain lit upon completion of ejection.

② Audio dubbing button (AUD. DUB)

Press together with the PLAY button ⑤ to record audio on a pre-recorded tape. Audio dubbing is possible only for the right-channel. During audio dubbing, the A.DUB and PLAY indicators light. (The PLAY indicator flickers first until tape loading is completed.)

③ Record button (REC)

Press together with the PLAY button for video and audio recording. Audio is recorded on both channels, if there are input signals for them. The REC and PLAY indicators light during recording. (The PLAY indicator flickers first until tape loading is completed.)

④ STOP button

To stop the tape. When the STOP button is pressed, the tape is unloaded and then the Stop mode is engaged. The STOP indicator flickers during tape unloading and remains lit upon completion of unloading.

⑤ PLAY button

Press to start playback. The PLAY indicator will light. Press together with the REC button to start recording.

⑥ Rewind button (REW)

Press to rewind the tape inside the cassette. While the tape is being rewound, the REW indicator will light. This button can be pressed in any mode except Record or Eject. To release the Rewind mode, press the PLAY, STOP, PAUSE/STILL or FF button, depending on the mode you want to select next. Pressing this button in the Play or Still mode enables high-speed playback at about 10 times normal in the reverse direction. During search the REW indicator will remain lit.

⑦ Fast Forward button (FF)

Press to fast forward the tape inside the cassette. While the tape is being fast forwarded, the FF indicator will light. This button can be pressed in any mode except Record or Eject. To release the Fast Forward mode, press the PLAY, STOP, PAUSE/STILL or REW button, depending on the mode you want to select next. Pressing this button in the Play or Still mode enables high-speed playback at about 10 times normal in the forward direction. During search the FF indicator will remain lit.

⑧ PAUSE/STILL button

Press to stop the tape temporarily during recording or playback. To release the Pause or Still mode, press any button except EJECT corresponding to the mode you wish to enter next.

The still picture is advanced each time this button is pressed.

⑨ SEARCH button

Press to change the playback speed instantly to that previously set with the rotary search dial ⑩.

CONNECTOR SECTION

⑩ PHONES LEVEL control

Turn to adjust the output level of the PHONES jack ⑪.

⑪ PHONES jack

Connect a set of headphones having an impedance of 8 ohms. The signal selected with the AUDIO MONITOR switches ⑯ ⑰ can be heard.

⑫ Microphone jacks (MIC LEFT/RIGHT)

Connect microphones having an impedance of 600 ohms and a sensitivity of -70 dBm. The microphone input is recorded only onto the normal audio tracks.

⑬ 8-pin remote control terminal (REMOTE)

A JVC exclusive remote control unit may be connected to this terminal.

METER SECTION

⑭ TRACKING control

To remove noise bars during playback, turn this control so that the meter ⑮ makes its maximum deflection.

⑮ TRACKING/VIDEO LEVEL meter

This meter functions as a tracking meter during playback and as a video level meter during recording.

⑯ VIDEO LEVEL control

To adjust the video recording level manually, set the VIDEO AGC switch ⑰ to OFF and turn this control so that the meter ⑯ deflects into the green area.

⑰ LEFT AUDIO REC LEVEL meter

This meter indicates the level of the left-channel audio signal (playback signal during playback or E-E signal in any other mode).

⑯ Hi-Fi/NORMAL LEFT AUDIO REC LEVEL controls

To adjust the left channel Hi-Fi or NORMAL audio recording level, turn these controls so that the meter ⑰ deflects to "0" with the loudest signal.

⑲ Hi-Fi/NORMAL METER select switch

⑳ RIGHT AUDIO REC LEVEL meter

This meter indicates the level of the right-channel audio signal (playback signal during playback or E-E signal in any other mode).

㉑ Hi-Fi/NORMAL RIGHT AUDIO REC LEVEL controls

To adjust the right channel Hi-Fi or NORMAL audio recording level, turn these controls so that the meter ㉑ deflects to "0" with the loudest signal.

SELECT SWITCH SECTION

㉒ Hi-Fi REC select switch

ON: Set to this position to record the Hi-Fi audio signals.
OFF: Set to this position when recording the Hi-Fi audio signals is not desired. (The FM carrier signal will also be cut off)

㉓ AUDIO LIMITER switch

Set to ON to activate the built-in audio limiter circuit. The limiter circuit can be switched on or off simultaneously for the two audio tracks and manual level control is possible even when the limiter circuit is switched on.

㉔ Audio noise reduction switch (NR)

Set to ON to activate the built-in Dolby* noise reduction system to reduce tape hiss.

㉕ AUDIO MONITOR AUD-1/MIX/AUD-2 select switch

This switch selects the different audio outputs available from PHONES jack ⑪, MONITOR OUT connector ㉖ and 8-pin TV connector ㉗.

AUD-1: To hear channel-1 audio.

MIX: To hear a mixture of channel-1 and channel-2 audio.

AUD-2: To hear channel-2 audio.

㉖ AUDIO MONITOR NORMAL/Hi-Fi select switch

This switch selects the type of audio output available from PHONES jack ⑪, MONITOR OUT connector ㉖ and 8-pin TV connector ㉗.

NORMAL: To hear NORMAL audio signals.

Hi-Fi: To hear Hi-Fi audio signals.

㉗ VIDEO AGC switch

Set to ON to activate the built-in video AGC circuit.

㉘ VIDEO INPUT select switch

LINE: Set to this position to record video signals input via VIDEO IN connector ㉙ and audio signals input via AUDIO IN (NORMAL/Hi-Fi) connectors ㉚ ㉛ or MIC jacks ㉜.

DUB: Set to this position to record video signals input via DUB IN connector ㉚ and audio signals input via AUDIO IN (NORMAL/Hi-Fi) connectors ㉖ ㉗ or MIC jacks ㉜.

㉙ COUNTER REPEAT switch

Automatic repeat playback of specific sections of the tape or automatic search to the counter reading of "0", etc. is possible.



: In this position, repeated playback from the counter reading of "0000" to the tape end is possible.



FULL : The tape will be automatically rewound at its end (as usual) and played back repeatedly when it reaches its beginning. The entire tape can be played back again and again automatically.



: In this position, repeated playback from the beginning of the tape to the counter reading of "0000" is possible.



Note: The marks for switch positions indicate a 4-digit figure (0000). However, the actual counter indication for zero is a 1-digit figure (0).

㉚ AUTO MODE switch

This switch selects automatic operations.

MEMORY: The tape stops automatically when it is rewound or fast forwarded to the point corresponding to the counter reading of "0" and the unit enters the Stop mode.

OFF: No automatic operation. Be sure to set this switch to OFF when using the BR-6600E as a source player in editing.

COUNTER

REPEAT: See ㉙.

③ LOCAL/REMOTE select switch (on rear panel)

LOCAL: Set to this position when the recorder is to be controlled with its own function buttons. (With this switch set to the LOCAL position, the remote control unit connected to the rear panel 45-pin or front panel 8-pin REMOTE connector will no function.)

REMOTE: Set to this position when the recorder is to be remote-controlled with the remote control unit connected to the 45-pin or 8-pin REMOTE connector. (No function buttons of the recorder except STOP and EJECT will function when this switch is set to the REMOTE position.)

④ POWER button

Press to turn the power on. The level meters and the counter display will be illuminated. Pressing again will switch the power off.

⑤ Search dial

This search dial becomes operative by pressing the SEARCH button ⑨. When the dial is set to STILL (centre position), the Still mode is engaged. When the dial is turned clockwise toward FWD, forward playback takes place at a speed corresponding to the dial setting. When the dial is turned counter-clockwise toward REV, reverse playback takes place at a speed corresponding to the dial setting. The search speed is continuously variable between 1/15 and 5 times normal in both directions. When the dial is turned fully clockwise or counterclockwise past the 5-times-normal setting, the maximum search speed of about 10 times normal is obtained. If the control mode is changed by any function button, the dial setting remains unchanged; when the SEARCH button ⑨ is pressed, playback speed and direction corresponding to the dial setting are automatically restored.

⑥ Counter reset button (RESET)

Press to reset the tape or lap time counter to zero.

⑦ Display mode select button (TAPE/LAP)

The fluorescent display functions as a tape counter with this button in its "out" position. When the button is pressed in, the display changes to a lap time counter. To change back to the tape counter, press the button once again.

⑧ Electronic tape counter/Lap time counter/Tape-end warning indicator

This fluorescent display functions as a 4-digit tape counter or a 5-digit lap time indicator, depending on the setting of the display mode select button. In either mode, the display starts flashing 5 to 10 minutes before the tape end during recording. While the tape is being wound in the forward direction, the counter reading advances in the direction of increasing numbers. While the tape is being wound in the reverse direction, the counter reading changes in the direction of decreasing numbers and after zero a "minus" sign appears.

⑨ Cassette loading slot

With the POWER button pressed to ON, insert a video cassette with its labelled edge facing toward you. The cassette carriage itself will automatically take control and retract the cassette into the correct loaded position. The lower door flap will show a mark indicating that a cassette is loaded.

⑩ Audio noise reduction indicator (NR)

Lights when the built-in Dolby* noise reduction system is activated.

⑪ WARNING indicator (WARNING)

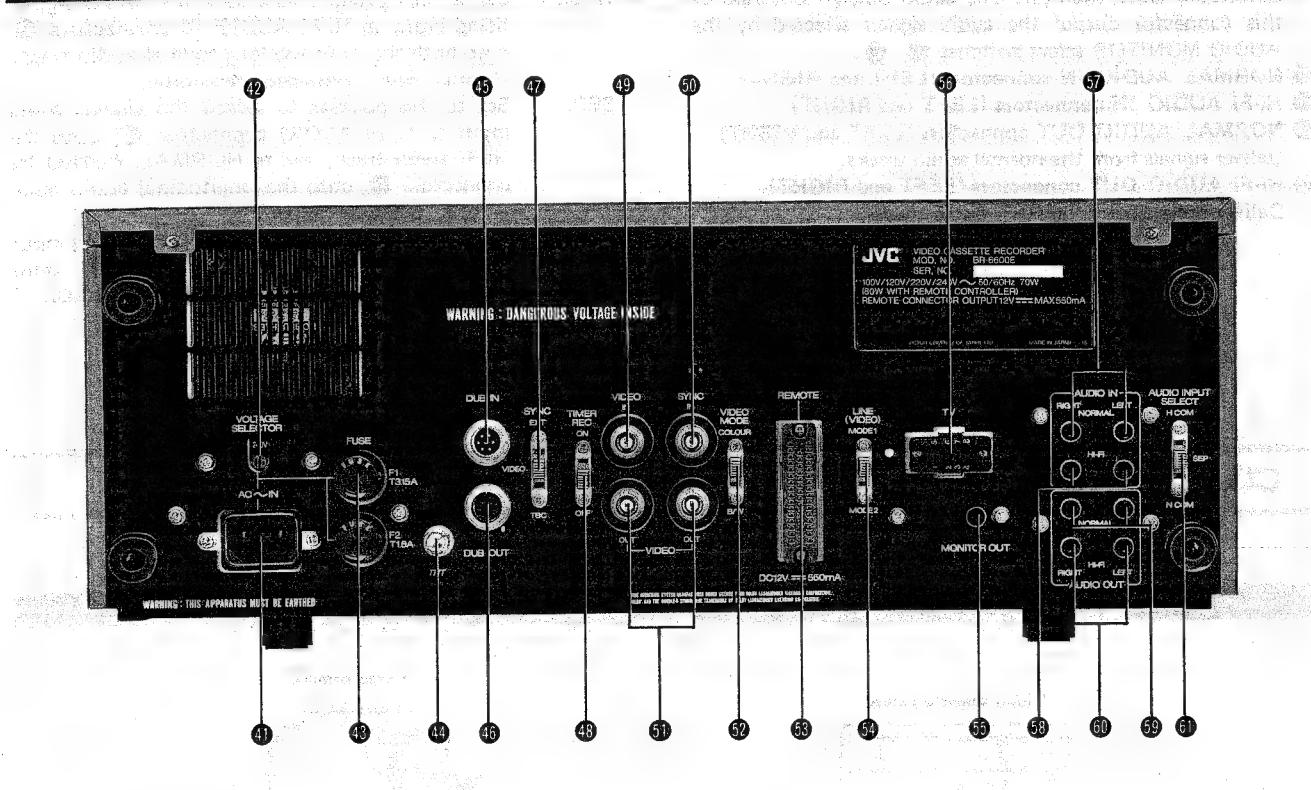
If the tape running is in some way incorrect, this indicator starts flashing. The causes may be:

- (1) the moisture condensation sensor is in operation;
- (2) the tape-end sensor lamp has blown;
- (3) the head drum does not rotate;
- (4) the eject mechanism does not operate properly;
- (5) the automatic loading and unloading mechanism does not operate properly;
- (6) a tape recorded in the LP (Long Play) mode is played back.

⑫ Hi-Fi REC indicator

Lights when the Hi-Fi audio signals are being recorded.

REAR PANEL



④1 AC input socket (AC IN)

④2 VOLTAGE SELECTOR

See "POWER SYSTEM" on page 1.

④3 Fuse holders

④4 Ground terminal (—)

④5 DUB IN connector

Receives signals from the 7-pin dubbing output connector of a source player via the 7-pin dubbing cable.

④6 DUB OUT connector

When dubbing from the BR-6600E to a second recorder equipped with a 7-pin dubbing input connector, connect DUB OUT to the dubbing input using the 7-pin dubbing cable.

④7 SYNC SELECT switch

For selecting between different reference sync signals for the servo systems during recording and playback.

EXT: To lock to the external sync signal applied to the EXT SYNC IN connector on the rear panel.

VIDEO: To lock to the incoming video signal of the selected input.

TBC: To lock to the sync signal from a Time Base Corrector (TBC).

With this switch set to TBC, the external sub-carrier mode is automatically engaged, and stable still and search pictures will be obtained.

④8 Timer recording select switch (TIMER REC)

Power can be switched on using an ordinary timer.

When the switch is set to ON, the recorder starts recording when the preset time is reached and, at the end of the tape, enters the Rewind mode automatically and stops at the beginning of the tape.

④9 VIDEO IN connector

Input connector for video signals.

⑤0 External sync signal input connector (SYNC IN)

This input connector accepts an external reference sync signal when the recorder is to be operated in the external sync mode. The external sync signal can be a composite sync signal or a composite video signal.

⑤1 VIDEO OUT connectors

Output connectors for video signals.

⑤2 VIDEO MODE select switch

Select one of the two positions according to the input signal during recording or the output signal during playback. COLOUR: Set to this position when the input or playback video signal is a colour signal.

B/W: Set to this position when the input or playback video signal is a monochrome signal. A higher resolution picture will be obtained.

⑤3 REMOTE control connector (45-pin)

Connect a suitable JVC remote control unit.

⑤4 LINE (VIDEO) output mode select switch

MODE 1: Set to this position before video-video dubbing. This improves the resolution of the playback picture in video-video dubbing, and helps maintain the picture quality even after video-video dubbing has been performed several times.

MODE 2: Normally set to this position.

⑤5 MONITOR OUT connector

The audio signals selected by AUDIO MONITOR select switches ②3 ②6 are output at this connector.

- ⑤ TV monitor connector (8-pin)**
Connect a video monitor. The audio output terminals of this connector output the audio signals selected by the AUDIO MONITOR select switches ②5 ②6.

⑥ NORMAL AUDIO IN connectors (LEFT and RIGHT)

⑦ Hi-Fi AUDIO IN connectors (LEFT and RIGHT)

⑧ NORMAL AUDIO OUT connectors (LEFT and RIGHT)
Deliver signals from the normal audio tracks.

⑨ Hi-Fi AUDIO OUT connectors (LEFT and RIGHT)
Deliver signals from the Hi-Fi audio tracks.

⑩ AUDIO INPUT SELECT switch

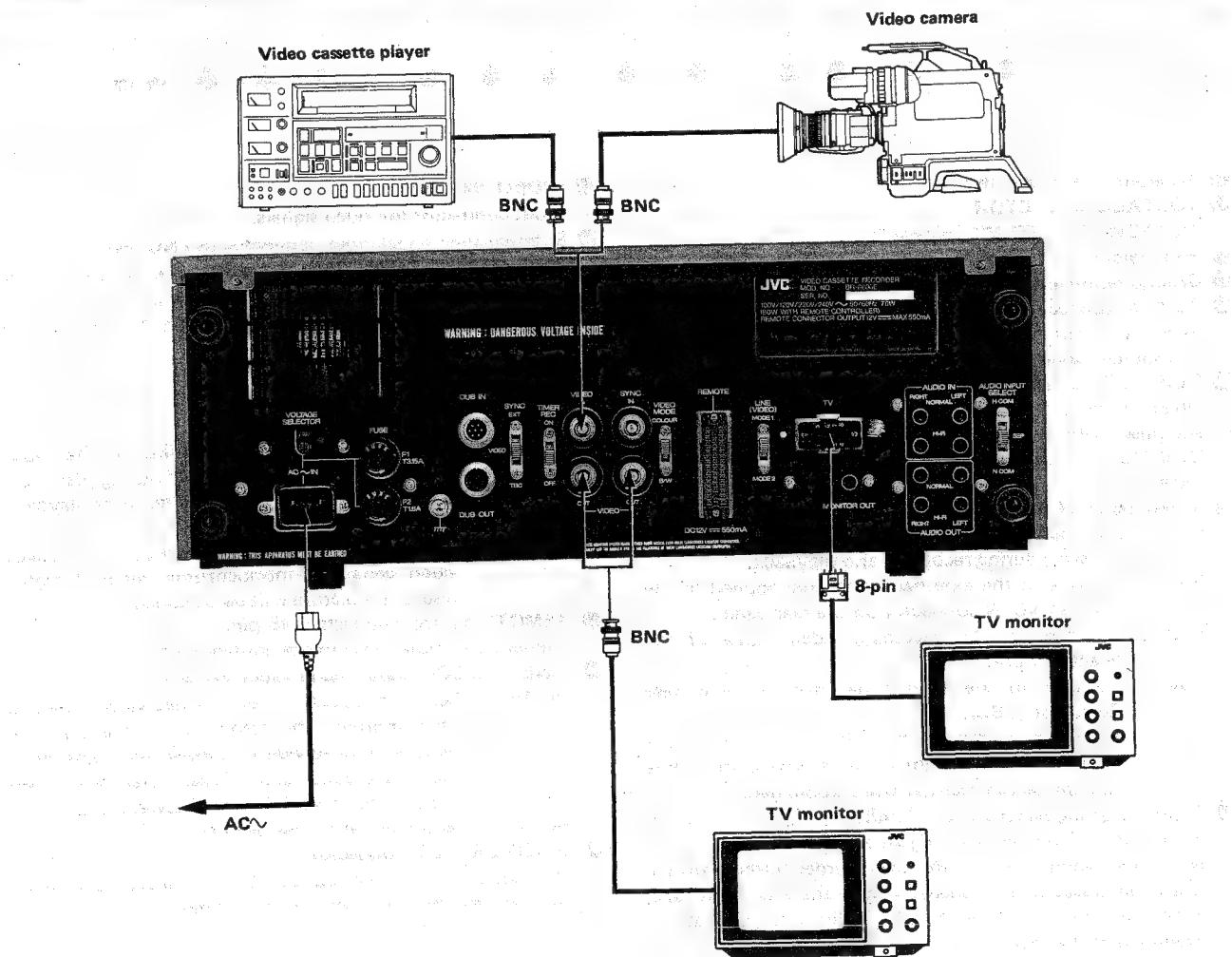
H COM: Set to this position to record the audio signals being input to Hi-Fi AUDIO IN connectors ⑤ onto both the Hi-Fi and longitudinal audio tracks — for a “Hi-Fi Combined” recording.

SEP: Set to this position to record the signals being input to Hi-Fi AUDIO connectors ⑦ onto the Hi-Fi audio track, and to NORMAL AUDIO IN connectors ⑥ onto the longitudinal audio track — for a “Separate” recording.

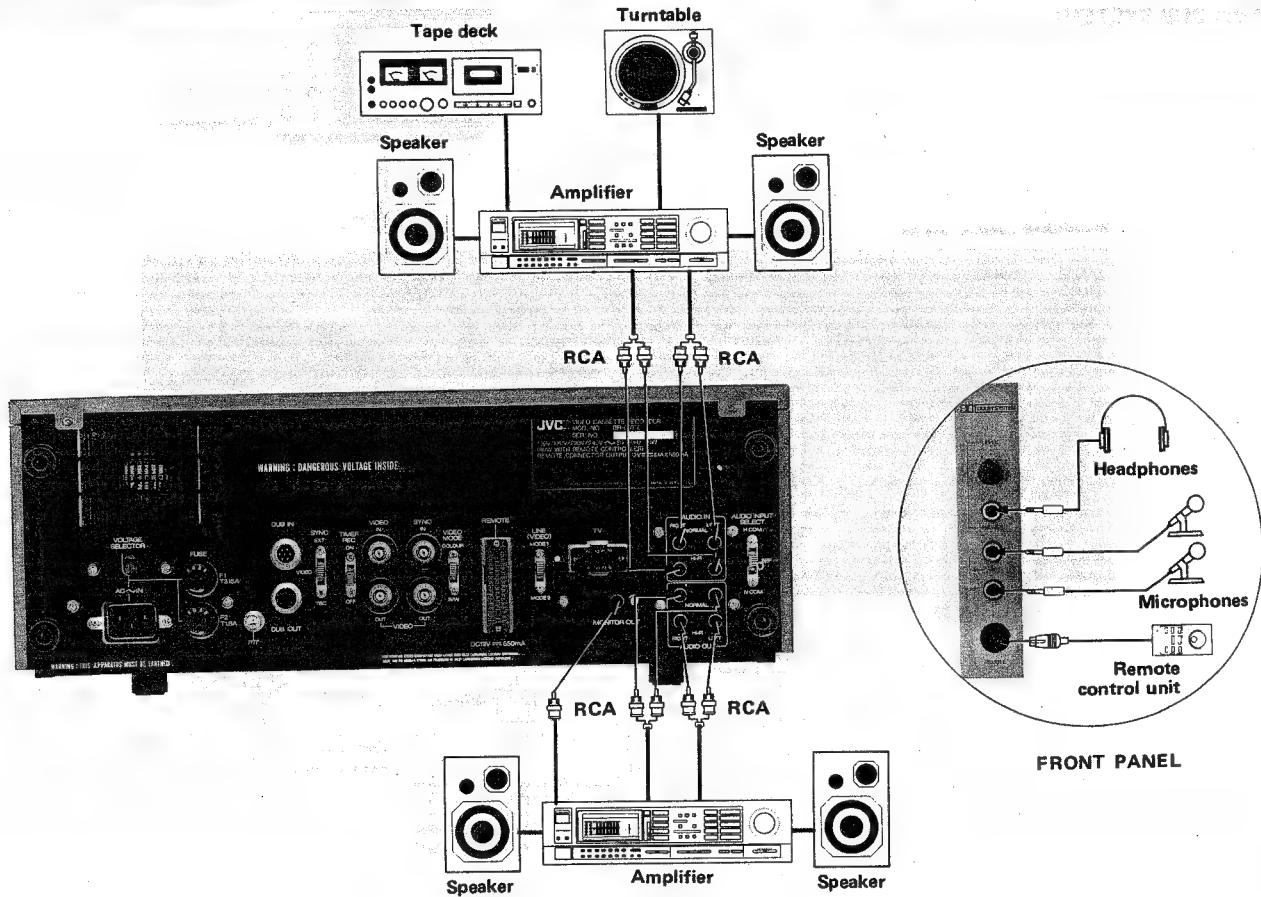
N COM: Set to this position to record signals being input to NORMAL AUDIO IN connectors ⑧ onto both the Hi-Fi and longitudinal audio tracks — for a “Normal Combined” recording.

CONNECTIONS

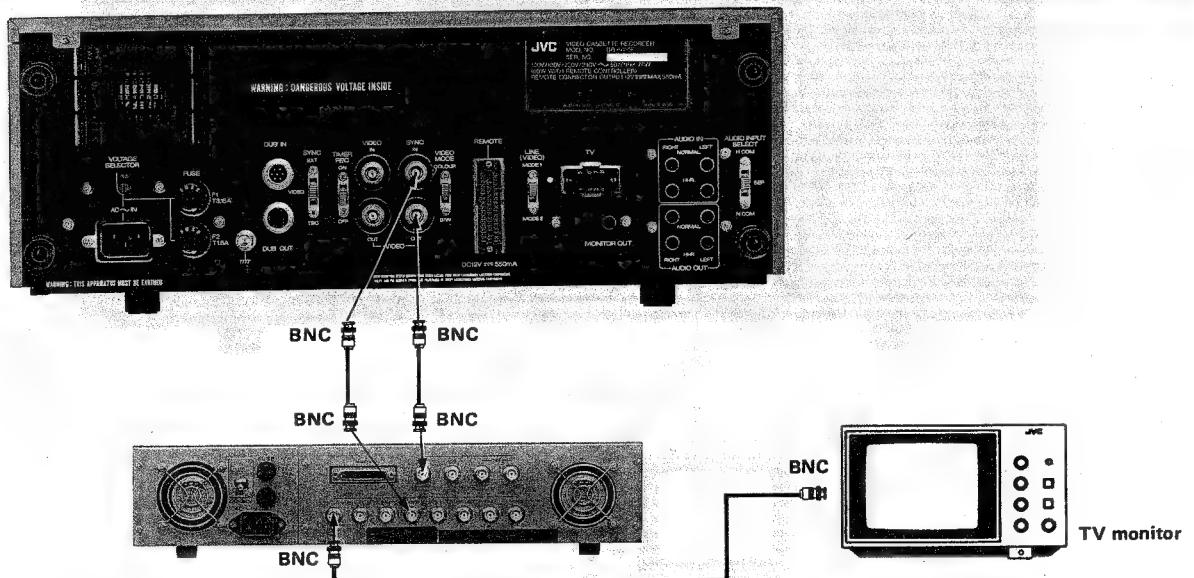
VIDEO EQUIPMENT CONNECTION



AUDIO EQUIPMENT CONNECTION



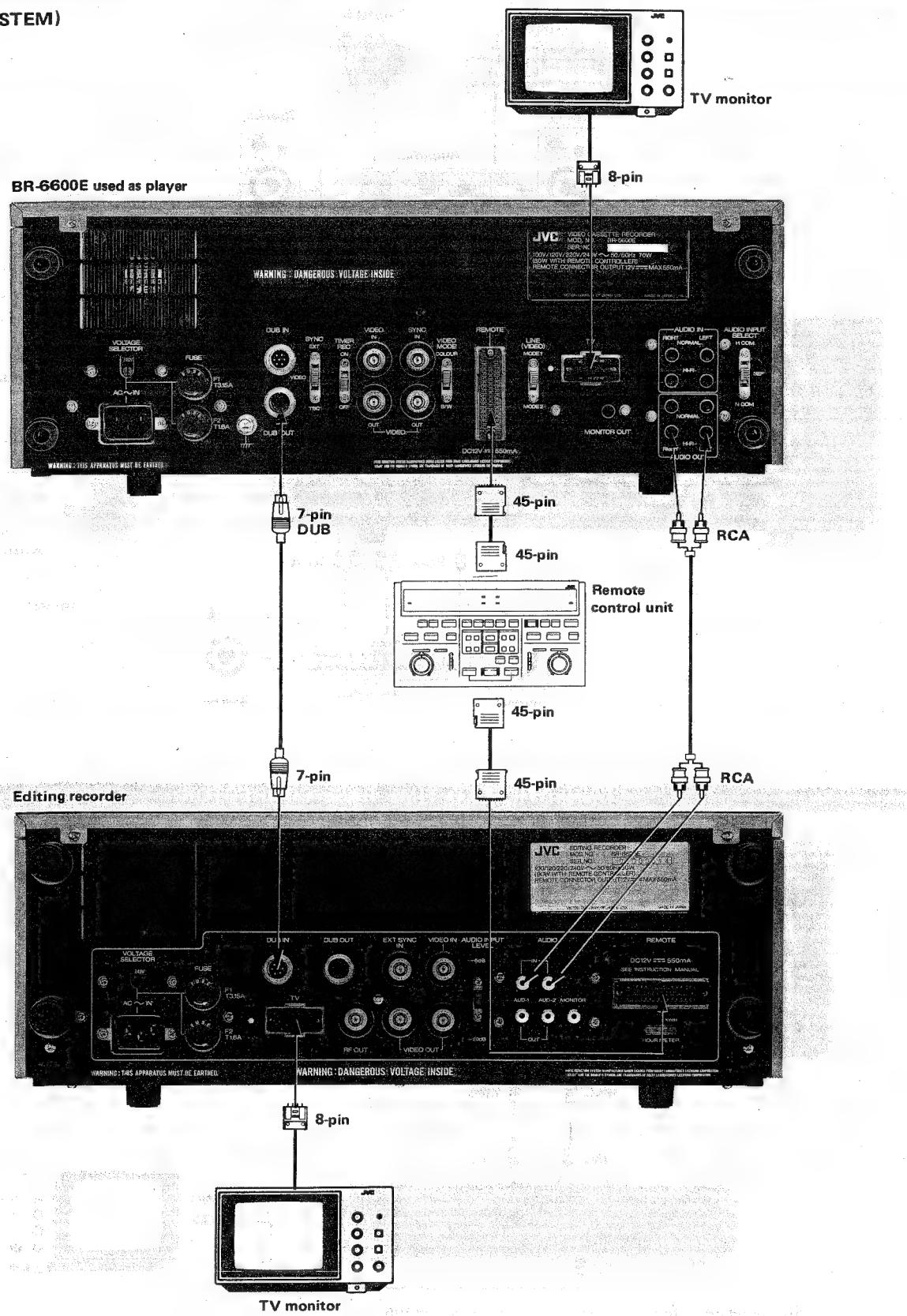
CONNECTION TO TIME BASE CORRECTOR



With a TBC connected, be sure to set the SYNC select switch to TBC.

CONNECTION FOR TAPE-TO-TAPE EDITING

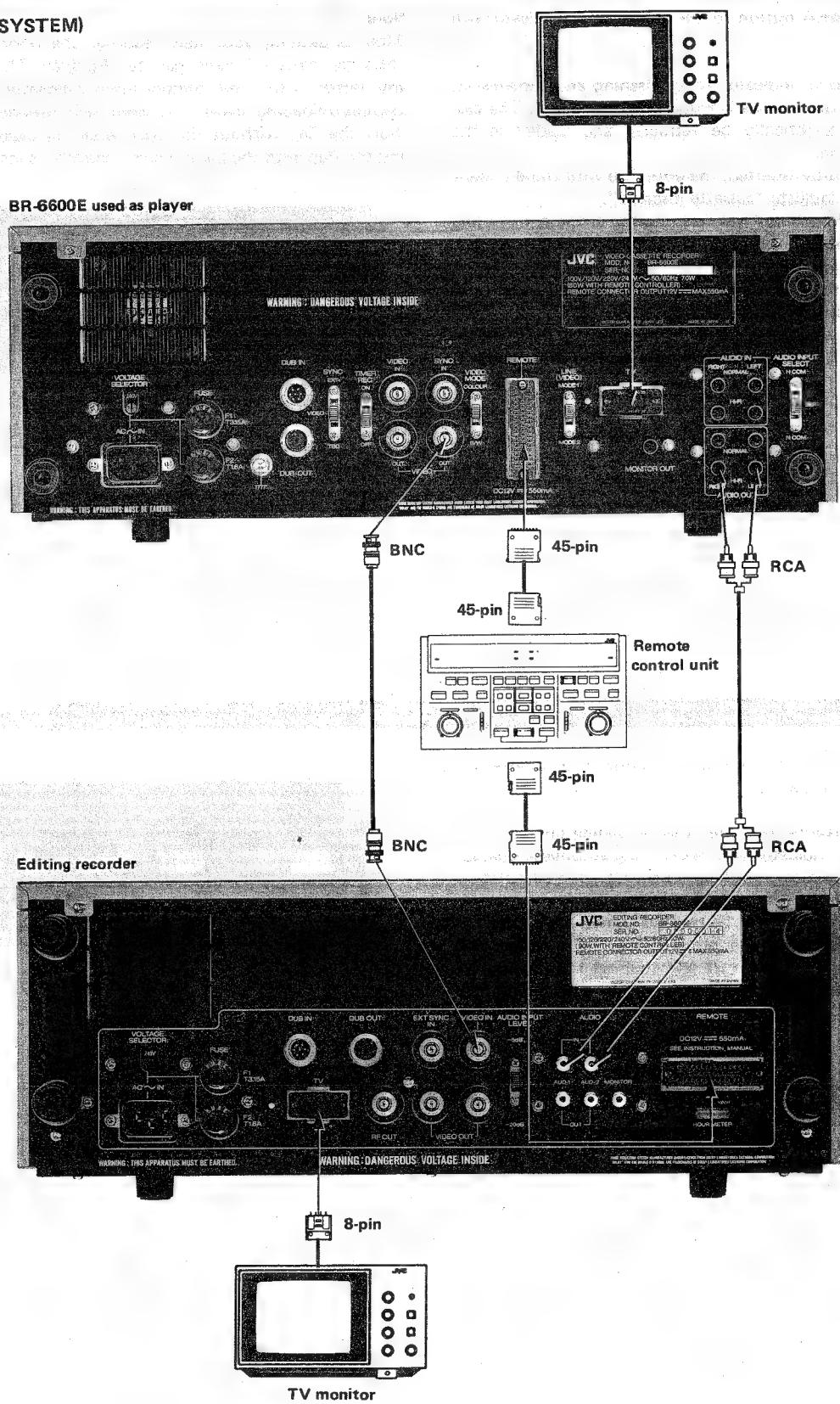
(7-pin DUB SYSTEM)



CONNECTION FOR TAPE-TO-TAPE EDITING

(VIDEO DUB SYSTEM)

BR-6600E used as player



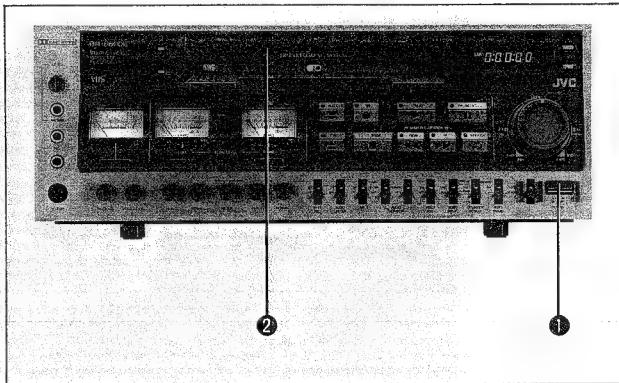
LOADING AND UNLOADING A VIDEO CASSETTE

LOADING

- ① Press the POWER button to ON. The EJECT indicator will flash.
- ② After the EJECT indicator stops flashing and remains lit, insert a cassette with its labelled side facing you. The cassette will automatically be retracted and loaded in the correct position.
 - With a cassette inserted, the door flap with the  mark appears to indicate "cassette inserted".
 - The STOP indicator will flash during automatic loading of the cassette and, when it has been correctly loaded, will remain lit.
 - The automatic loading mechanism will operate only when the cassette is inserted correctly.
 - If loading does not result in positioning the cassette correctly, it will automatically be ejected after about 6 seconds.

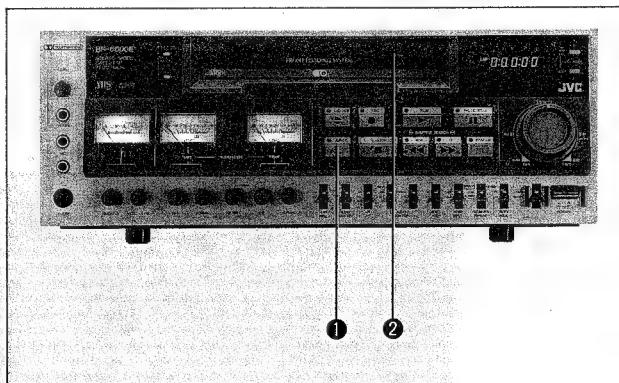
Note:

REMEMBER THIS ORDER
After unpacking your new recorder the door flap with the "cassette inserted" mark may be displayed. This is not due to any defect of the unit. Simply insert a cassette. After the first loading/unloading cycle, the door will function properly to show the flap without the mark when no cassette is inserted and the flap with the mark when a cassette is inserted.



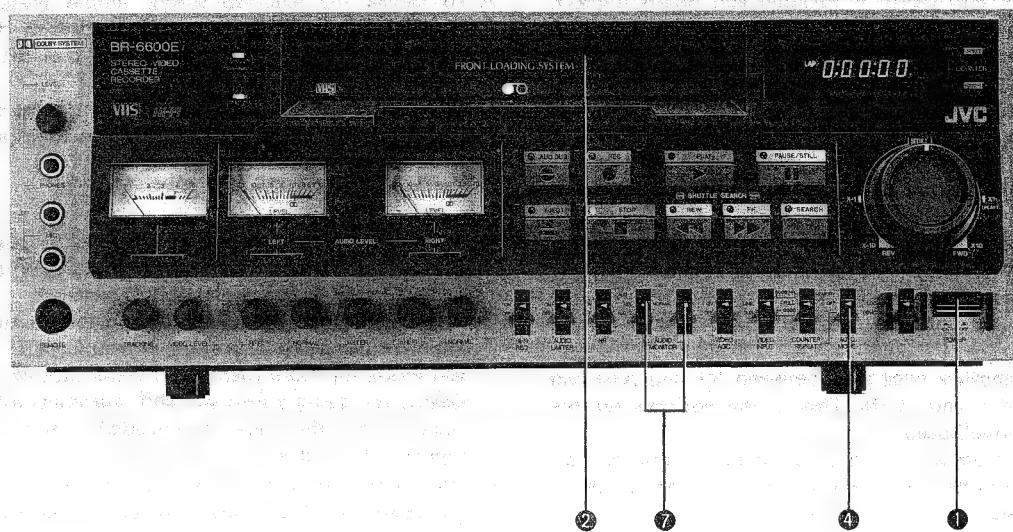
UNLOADING

- ① Press the EJECT button in the Stop mode. The cassette will automatically be ejected.
- ② Remove the cassette from the cassette loading slot.
 - The EJECT indicator will flash during automatic unloading of the cassette and then remains lit upon completion of ejection.
 - The EJECT button can be pressed immediately after the STOP button has been pressed. The logic circuit will memorise the sequence; it will first set the recorder in the Stop mode and then automatically change it to the Eject mode.



PLAYBACK

PREPARATIONS



- ① Press the POWER button to ON.
- ② Insert a prerecorded video cassette into the cassette loading slot.
- ③ Set the SYNC switch on the rear panel to VIDEO.
 - If an external sync signal is used, set it to EXT.
 - If a TBC is used, set it to TBC.
- ④ Set the AUTO MODE switch to OFF.
- ⑤ Set the VIDEO MODE switch on the rear panel to COLOUR.
 - If the recorded video signal is monochrome, set it to B/W.
- ⑥ Set the LINE (VIDEO) switch on the rear panel to MODE 2.
 - If dubbing is expected to be repeated for several generations, set it to MODE 1.

⑦ Set the AUDIO MONITOR switches as follows.

- Set to NORMAL or Hi-Fi depending on the sound to be checked.
- Set to AUD-1, AUD-2 or to MIX as required.

Note:

If a video signal is applied to either VIDEO IN connector, playback is locked to this video signal. Therefore, if the sync signal contained in this video signal is not stable, the playback picture will be distorted when the SYNC switch is in the VIDEO position. In such a case, reset the switch to INT to engage the internal sync mode.

PLAYBACK

Procedure

1. Press the PLAY button. The tape will start running and the playback picture will appear on the monitor screen.
2. Press the STOP button to stop playback.

Tracking adjustment

When a tape recorded with a different recorder is played back, noise bars may appear or the picture may be blurred. In such a case, turn the TRACKING control to correct the picture referring to both the monitored picture and the tracking meter (VIDEO LEVEL meter). Optimum tracking is obtained when the meter makes its maximum deflection.

Note:

It is recommended that tracking be checked even when tapes recorded using this unit are played back.

Input monitoring during playback

If you wish to monitor the signal applied to the input connector during playback, press the REC button in the Play mode. The input signal will appear on the monitor screen.

Note:

Do not press the REC and PLAY buttons simultaneously, otherwise the unit enters the Record mode and any recordings on the tape are erased.

DIAL SEARCH & SHUTTLE SEARCH

VARIABLE-SPEED DIAL SEARCH IN BOTH DIRECTIONS

This function is very useful in locating edit points quickly. The search speed is continuously variable between about 1/5 and 5 times normal in both directions. The speed of about 10 times normal is also available when the dial is fully turned in either direction.

1. Turn the search dial until the desired search speed is reached.

- The STILL position (centre click-stop) provides a still picture.
- Turn the dial clockwise to search in the forward direction; counterclockwise to search in the reverse direction.
- The X1 click-stop provides normal speed in the forward direction and X-1 give normal speed in the reverse direction.
- There is another click-stop between X1 and X10 and between X-1 and X-10. This is the position for the 5 times normal speed.
- The fully clockwise or counterclockwise position corresponds to the maximum search speed of about 10 times normal.

2. To cancel the adjusted speed, simple press the PLAY, PAUSE/STILL, REW, FF or STOP button depending on the mode to be entered next. The dial setting remains unchanged.

- To enter the dial search mode again, press the SEARCH button. The speed corresponding to the dial setting will be stored instantly.

Notes:

- During search, an extra pair of video heads operate and pick up only odd-number fields of the picture. When the dial is set to X1 or X-1, frame playback is engaged.
- If the Still mode continues for too long a time, the tape could be damaged. Therefore, if you leave the unit in the Still mode for more than about 3 minutes 45 seconds, the video track being traced will shift automatically. After two more shifts, the tape is unloaded automatically (after approx. 12 minutes).
- The search dial does not function for about 2 seconds after the REMOTE/LOCAL switch is reset to REMOTE.

SHUTTLE SEARCH & REW/FF

When the REW or FF SHUTTLE SEARCH button is pressed in the Stop mode, normal rewind or fast forward takes place. When these buttons are pressed in the Play, Search or Still mode, the tape runs at about 10 times normal speed in the corresponding direction. The buttons can be locked and the indicator lights. You can follow the speeded-up picture on the monitor screen.

Note:

The tape counter on the RM-86U remote controller does not function in the normal rewind and fast forward modes.

COUNTER SEARCH, AUTO REWIND & REPEAT PLAYBACK

COUNTER SEARCH

The counter search mechanism functions in conjunction with the tape counter and stops the tape automatically in the Rewind or Fast Forward mode at the counter reading of "0".

1. Change the display to the tape counter mode by pressing the TAPE/LAP button.
2. Press the COUNTER RESET button at a point which you may wish to locate later.
3. Set the AUTO MODE switch to MEMORY.

4. Press the REW or FF button when you need to return to the designated point. The tape will stop automatically at the counter reading of "0".

Notes:

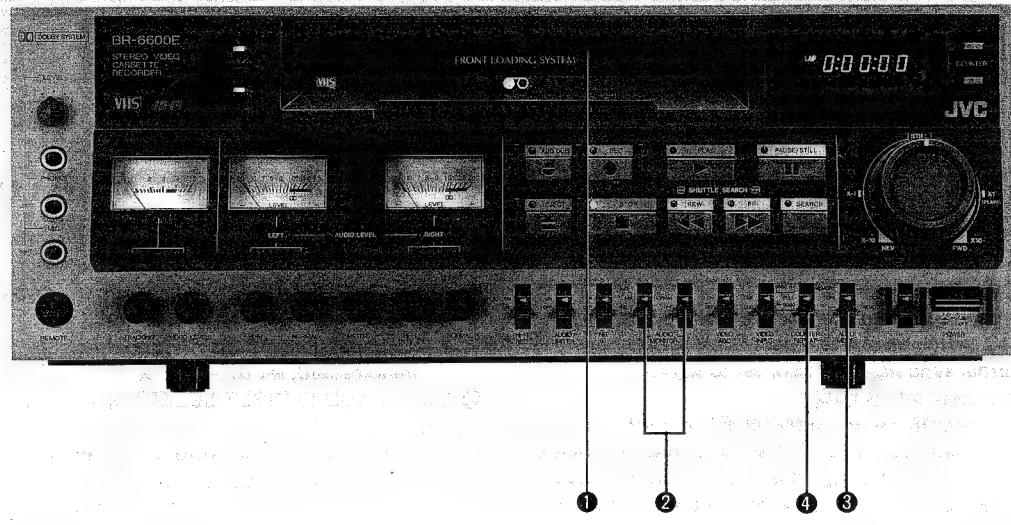
- The counter search mechanism does not function in the Shuttle Search mode.
- The tape may stop at a position slightly deviating from the counter reading of "0".

AUTO REWIND

When the tape reaches its end in the Play or Record mode, it is automatically rewound to the beginning and then the Stop mode is engaged. The counter search mechanism functions automatically while the tape is being rewound. If the

tape reaches its end in the Fast Forward mode, the auto rewind mechanism does not function and the Stop mode is engaged immediately.

REPEAT PLAYBACK



- ① Load a pre-recorded cassette.
- ② Set the AUDIO MONITOR switches as follows.
 - Set to NORMAL or Hi-Fi depending on the sound to be checked.
 - Set to AUD-1, AUD-2 or to MIX as required.
- ③ Set the AUTO MODE switch to COUNTER REPEAT.

④ Set the COUNTER REPEAT switch as required.

0000 → : In this position, repeated playback from the counter reading of "0000" to the tape end is possible.

FULL : The tape will be automatically rewound at its end (as usual) and played back repeatedly when it reaches its beginning. The entire tape can be played back again and again automatically.

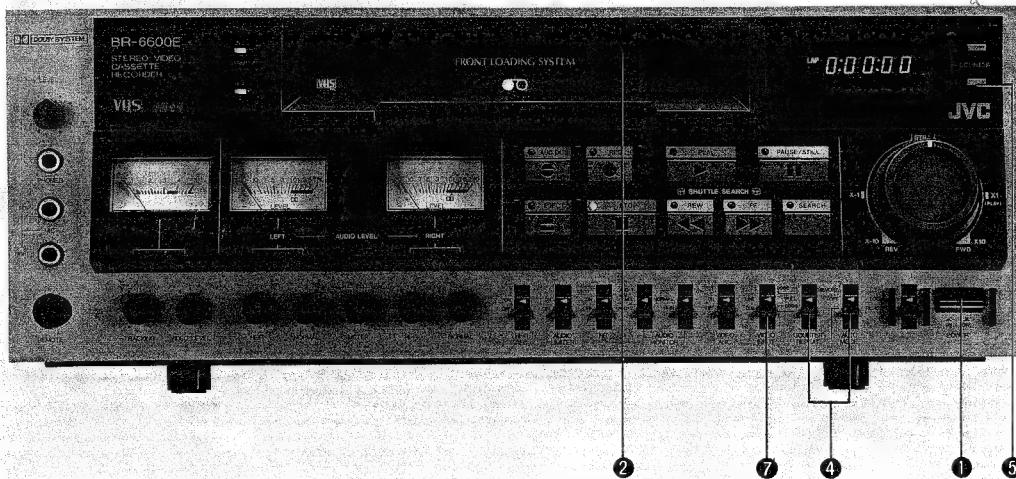
← 0000 : In this position, repeated playback from the beginning of the tape to the counter reading of "0000" is possible.

Note:

The marks for switch positions indicate a 4-digit figure (0000). However, the actual counter indication for zero is a 1-digit figure (0).

RECORDING

PREPARATIONS

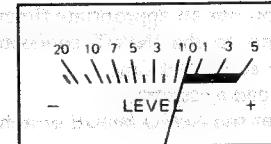
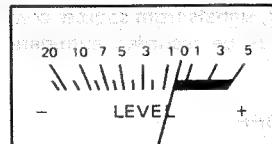
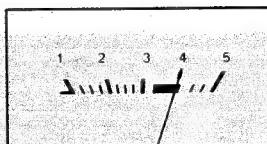


② ④ ⑤ ⑦ ⑧ ⑨

- ① Press the POWER button to ON.
- ② Insert a video cassette into the cassette loading slot.
- ③ Set the SYNC switch on the rear panel to VIDEO.
 - If an external sync signal is used, set to EXT.
 - If a TBC is used, set to TBC.
- ④ Set the AUTO MODE switch to MEMORY or OFF.
MEMORY: In this position, if the tape end is reached during recording, the tape is automatically rewound to the counter reading of "0" and stops.
OFF: No automatic operation.
- ⑤ Reset the tape counter by pressing the COUNTER RESET button.
 - If a microphone is connected to either MIC jack, the input from the corresponding AUDIO IN connector is automatically switched off.
- ⑥ Set the VIDEO MODE switch on the rear panel to COLOUR.
 - If the input video signal is monochrome, set it to B/W.
- ⑦ Set the VIDEO INPUT select switch as required.
LINE: To record the video signal from a source connected to the VIDEO IN connector together with the audio signals from the AUDIO IN (NORMAL or Hi-Fi) connectors or MIC jacks.
DUB: To record the video signal from a source connected to the DUB IN connector together with the audio signals from the AUDIO IN (NORMAL or Hi-Fi) connectors or MIC jacks.
 - If a microphone is connected to either MIC jack, the input from the corresponding AUDIO IN connector is automatically switched off.

- ⑧ Set the LINE (VIDEO) select switch on the rear panel to MODE 1.
 - If several generations of dubbing of the recorded picture are expected, set to MODE 2.
- ⑨ Set the AUDIO INPUT SELECT switch on the rear panel as required.
H COM: Set to this position to record the audio signals being input to the Hi-Fi AUDIO IN connectors onto both the Hi-Fi and longitudinal audio tracks — for a "Hi-Fi Combined" recording.
SEP: Set to this position to record the signals being input to the Hi-Fi AUDIO connectors onto the Hi-Fi audio track, and to the NORMAL AUDIO IN connectors onto the longitudinal audio tracks — for a "Separate" recording.
N COM: Set to this position to record signals being input to the NORMAL AUDIO IN connectors both the Hi-Fi and longitudinal audio tracks — for a "Normal Combined" recording.

RECORDING LEVEL ADJUSTMENTS



Video level adjustment

- For automatic level control, set the VIDEO AGC switch to ON.
- For manual level control, set VIDEO AGC to OFF and turn the VIDEO LEVEL control so that the VIDEO LEVEL meter deflects into the green zone while applying the video signal to be recorded.

Audio level adjustment

- Turn the AUDIO REC LEVEL controls (Hi-Fi and NORMAL, RIGHT/LEFT) until the AUDIO meters deflect to "0" with the loudest signals. This is the standard adjustment of the audio recording level.
- Set the AUDIO LIMITER switch to ON to avoid eventual over-level recordings.

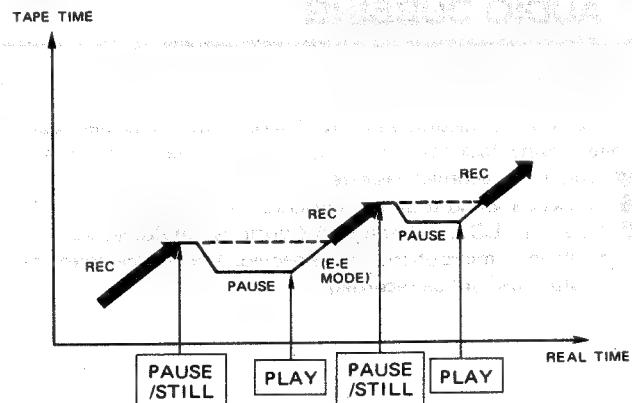
RECORDING

1. Press the REC and PLAY buttons simultaneously. The Record mode will be engaged and both the REC and PLAY indicators will light.
2. Press the STOP button to stop recording.

RECORD-PAUSE & ASSEMBLE RECORDINGS

Recording can be stopped temporarily and restarted without detectable distortion in the picture.

1. Press the PAUSE/STILL button during recording. Recording will be stopped with the REC indicator still lit. The tape is automatically rewound by about 2.5 seconds of program time and stops in the Record Pause mode with both the REC and PAUSE/STILL indicators lit. The E-E picture will appear on the screen. When the PAUSE/STILL button is pressed again in this state, the picture recorded immediately before can be seen as a still picture.
 - If recording is restarted immediately after the still picture appears, the top portion of the picture at the edit point may be skewed.
2. To restart recording, press the PLAY button. The tape will be played back for about 2.5 seconds (the picture on the screen is not the playback picture, but the input signal to be recorded) and the mode will switch automatically from playback to recording at the point where the PAUSE/STILL button was pressed.



TIMER RECORDING

If you use an appropriate timer unit, signals from sources connected to the INPUT connectors can be recorded automatically at a preset time.

- ① Load a cassette.
- ② Set the AUTO MODE switch to OFF.

Note:

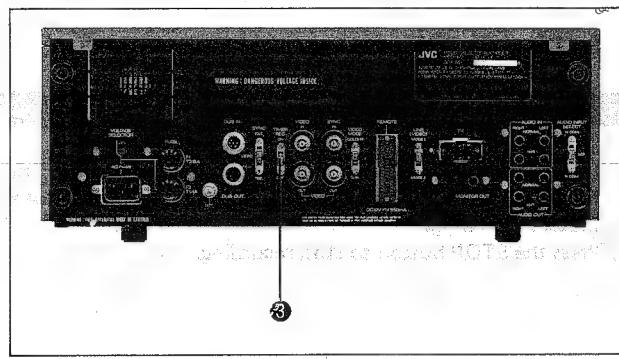
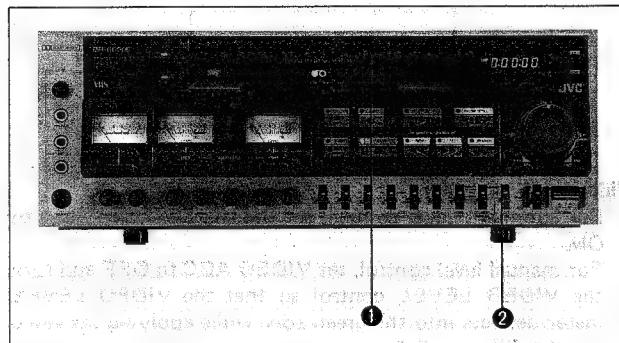
The marks for switch positions indicate a 4-digit figure (0000). However, the actual counter indication for zero is a 1-digit figure (0).

- ③ Set the TIMER REC switch to ON.

- There is no need to press the REC and PLAY buttons to engage the Recording Standby mode.
- When the tape reaches its end during timer recording, the tape is automatically rewound to the beginning and stops.

Notes:

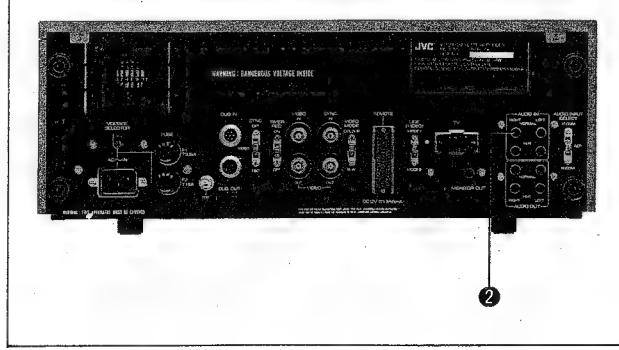
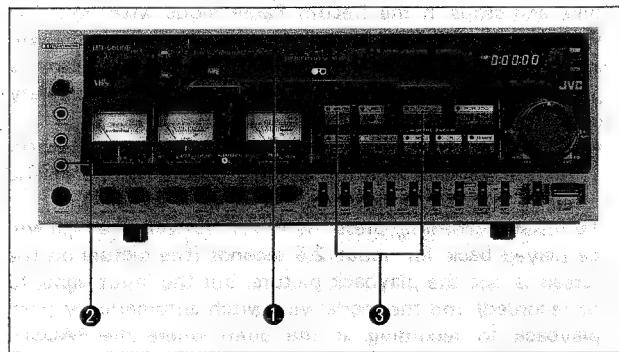
- As mentioned above, automatic rewinding starts at the end of the tape. Therefore, do not set the timer in such a way that it will switch off power during the process of rewinding.
- To cancel the timer recording mode, set the POWER switch to OFF and the TIMER switch off. Then set the POWER switch to ON.
- When the protection tab of the cassette has been removed, timer playback will take place instead of recording.



AUDIO DUBBING

If you wish to record only NORMAL RIGHT-channel audio while playing back the pre-recorded tape, proceed as follows:

- ① Load a pre-recorded cassette.
- ② Connect a sound source as required.
- ③ Press the AUD. DUB and PLAY buttons simultaneously.
 - When a microphone is connected, the source from the MIC jack will be recorded.



REFERENCE SYNC SIGNALS FOR RECORDING AND PLAYBACK

The reference sync signal for the servo systems during recording and playback differs as illustrated below, depending on

the setting of the SYNC switch and the presence of the signals applied to the input terminals.

SELECT switch		EXT	VIDEO	TBC
Presence of input signal	EXT-SYNC	VIDEO		
O	O	EXT	VIDEO	EXT
O	X	EXT	INT	EXT
X	O	VIDEO	VIDEO	VIDEO
X	X	INT	INT	INT

O : Input signal present X : No input signal

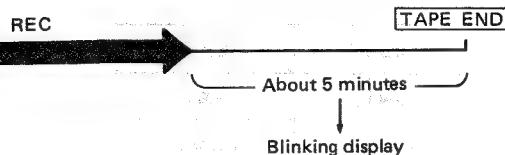
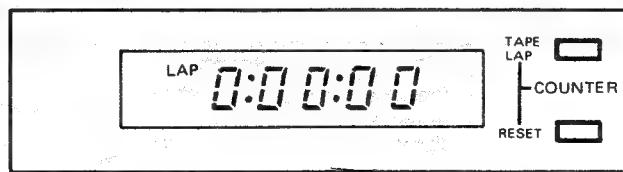
INPUT SELECT switch → LINE

WARNING INDICATORS

TAPE-END WARNING

Tape-end warning is given only during recording.

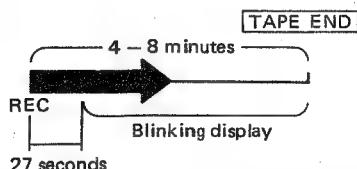
- The counter display starts blinking about 5 minutes before the end of the tape during recording.



Notes:

- The timing of tape-end warning differs slightly depending on the type of cassette.
- With an EC-30 compact video cassette (in its adapter), tape-end warning does not function.

- If recording is started with a cassette with a remaining tape time of only 5 minutes or so, the display starts blinking about 27 seconds after recording has started.



MALFUNCTION WARNING

The **WARNING** indicator shows several different malfunctions by different blinking intervals.

If it blinks with an interval of 0.6 sec,

- there may be something wrong with the tape transport, or
- the head drum is not rotating.

If it blinks with an interval of about 1.3 sec,

- the tape cannot be unloaded, or
- the tape-end sensor lamp has blown.

If it blinks with an interval of 0.8 sec,

- there is condensation inside the recorder.
- a tape recorded in the EP mode is played back.

Other warnings.

- If tape loading cannot be completed within 5 seconds, tape unloading takes place.
- If the cassette cannot be ejected within 7 seconds, the eject mechanism stops operating.



SECTION 1 DISASSEMBLY

1.1 EXTERNAL COVERS

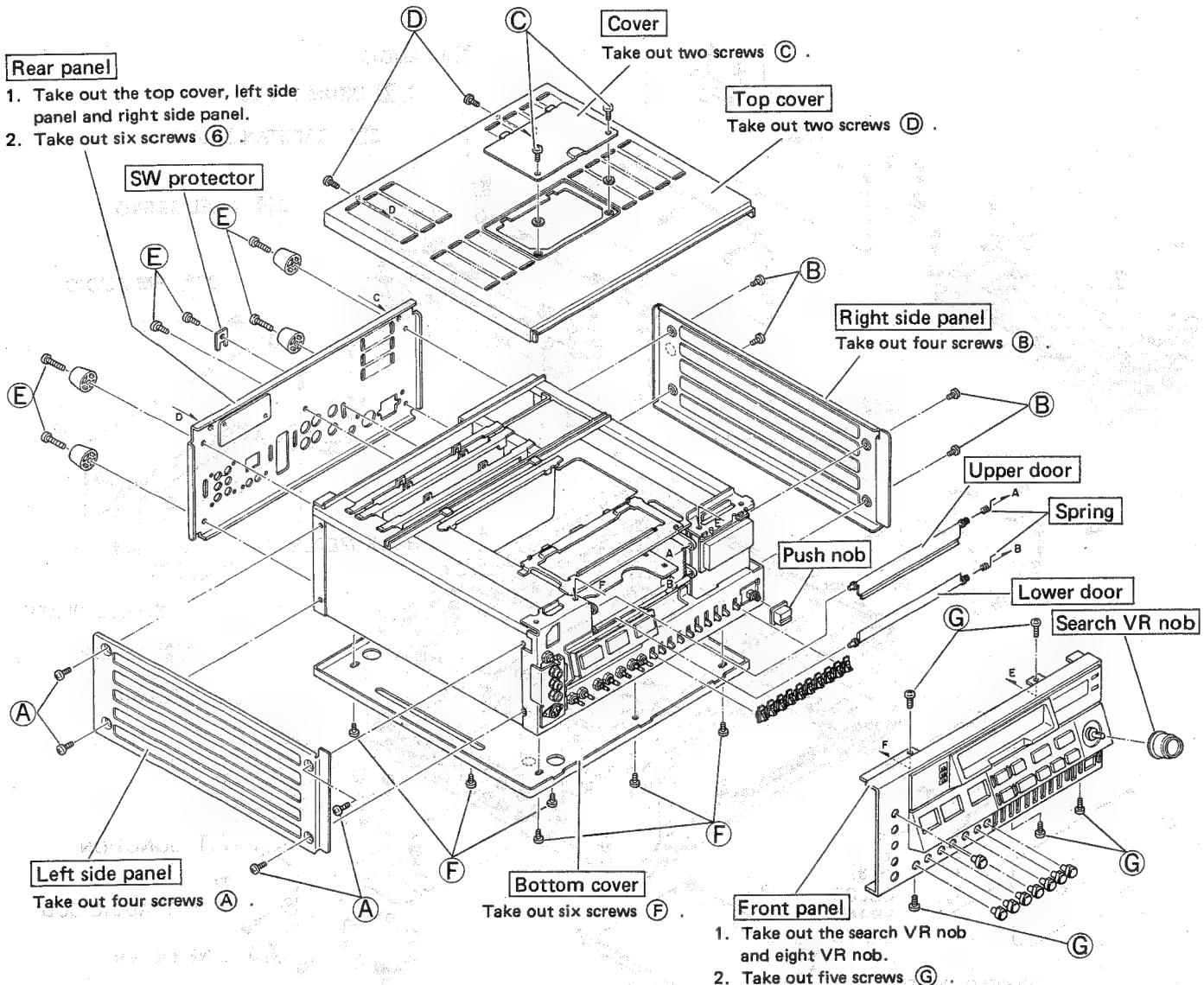


Fig. 1-1 External covers.

- Top cover
 1. Take out two screws and move the top cover in the arrow direction to remove it.
- Front panel
 1. Remove the top cover first.
 2. Take out five screws and move the front panel in the arrow direction to remove it.
- Bottom plate
 1. Take out six screws and move the bottom plate in the arrow direction to remove it.
- Rear panel
 1. Remove the top cover and both side panels.
 2. Take out six screws and move the rear panel in the arrow direction to remove it.

- Upper door and Lower door
 1. Remove the front panel.
 2. Move the lower door in the arrow direction to remove it. Use care regarding the spring.
 3. In the same manner, move the upper door in the arrow direction to remove it. Use care regarding the spring.
 4. When reassemble the doors, perform the following:
 - 1) Observe the upper door and recognize the mark on the gear portion.
 - 2) Set the long straight part of the spring toward the upper door.
 - 3) Install the upper door in the state with the mark corresponding with the mark of the upper door opener on the cassette housing.

1.2 CIRCUIT BOARD ASSEMBLIES

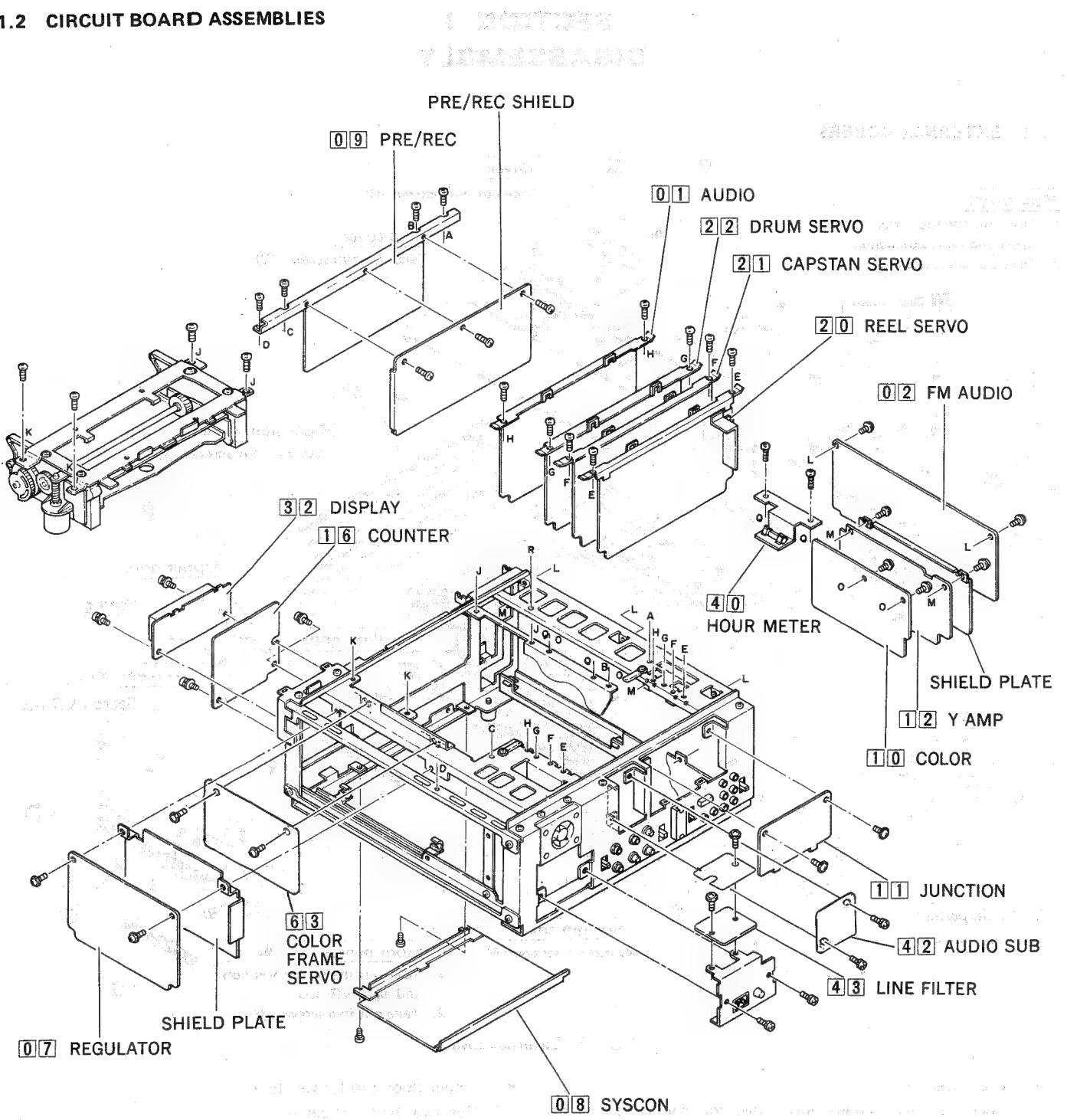


Fig. 1-2 Circuit boards

1.3 BR-6600E DIP SWITCHES

■ System control board

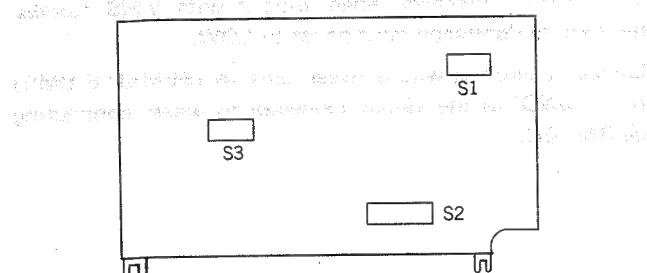


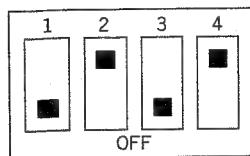
Fig. 1-3 DIP switch locations

1. Accessing the DIP switches
Position the set with the rear panel downward and remove the bottom panel. Take out 2 screws at the upper corners of the circuit board and open the board outwards.

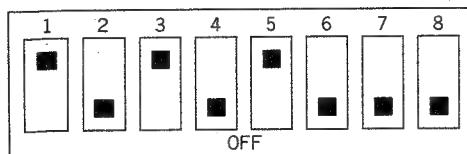
The DIP switch locations are illustrated in Fig. 1-3. When shipped from the factory, the DIP switches are set as indicated in Fig. 1-4.

2. DIP switch settings

DIP switch ①



DIP switch ②



DIP switch ③

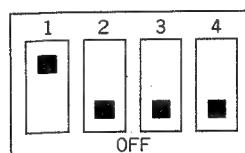


Fig. 1-4 DIP switch settings

1.3.1 S1

1. S1-1

Set to OFF.

2. S1-2 (REC ENABLE)

Set to ON to allow Recording mode entry.

3. S1-3

Set to OFF.

4. S1-4 (WARNING ENABLE)

Set to ON to allow reel, capstan and drum warning functions.

1.3.2 S2

1. S2-1 (DIRECT SEARCH ENABLE)

Set to ON to permit control of Search direction and speed from the SEARCH dial.

2. S2-2 (DIRECT EJECT ENABLE)

Unloading is performed in preparation for Eject.

3. S2-3 (AUTO REW ENABLE)

After detection of tape end, unloading is performed and the Rewind mode is entered.

4. S2-4

Set to OFF position.

5. S2-5 (LONG STILL ENABLE)

Long Still is performed as indicated in Table 1-1.

LONG STILL:

1st Step: After 3 minutes 45 seconds elapse, tape is transported in forward direction at 1/15th speed for 1 second.

2nd Step: After 7 minutes 30 seconds elapse, tape is transported in forward direction at 1/15th speed for 1 second.

3rd Step: After 12 minutes 15 seconds elapse, unloading is performed.

Table 1-1 Long still operation

6. S2-6, 2-7, S2-8

Set to OFF positions.

1.3.3 S3

1. S3-1

Set to ON position

2. S3-2

Set to OFF position.

3. S3-3, S3-4

These can be used to set the Preroll time as indicated in Table 1-2 and Fig. 1-5. Perform setting while power is supplied (POWER switch ON).

Preroll Time	S-3 setting	S3-4 setting
2.4 seconds (standard)	OFF	OFF
0.5 second	OFF	ON
3.0 seconds	ON	OFF
5.0 seconds	ON	ON

Table 1-2 Perroll time setting

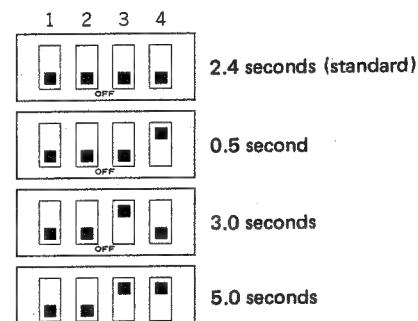


Fig. 1-5 Preroll time setting

■ Pre/Rec board

• Vertical pulse switch

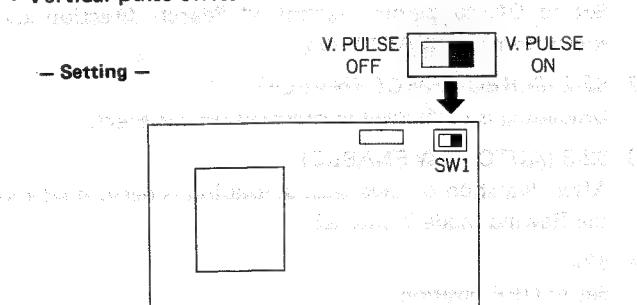


Fig. 1-6 V. pulse switch

In the Search and Still modes, vertical instability may occur with some types of monitor-TV. Setting this switch to ON adds a synthesized vertical sync pulse during Search and Still for improving stability.

However, when a time base corrector (TBC) is connected, this V sync pulse may interfere with proper operation. Therefore, set this switch to OFF when a TBC is connected.

1.4 RM-70U CONNECTION

The RM-70U Remote Controller is designed for use with 3/4" VCR's. Therefore, when using it with VHS models, the Remote Command must be set to LOW.

Connect a shorting wire between pins 15 (REMOTE CMD) and 1 (GND) of the 45-pin connector to allow connecting the RM-70U.

1.5 RM-P54U CONNECTION

The Search mode is not produced if the RM-P54U is connected to this model. To overcome this problem, connect a shorting wire between pins 15 (REMOTE CMD) and 1 (GND) of the 45-pin connector to allow connecting the RM-P54U.

When the RM-P54U is connected to this model, the following functions will not work:

• Remote control unit connection

SECTION 2 MECHANICAL ADJUSTMENT

2.1 GENERAL

The adjustments described in this section are those which can be performed by a qualified service technician. Those which require highly specialized equipment and training are omitted.

Proper maintenance and inspection are important both for ensuring top performance and preventing damage to the tape. Note that the required jigs must be employed when specified in the adjustment steps.

2.1.1 Precautions

- **IMPORTANT**

1. Always turn the power off before removing or soldering components.
2. When removing a screw from the chassis, be careful not to drop it into the mechanism. If a screw should be dropped, be sure to retrieve it.
3. Be extremely careful not to damage either the upper or lower head drum assemblies.
4. The tape transport mechanism has been precisely adjusted at the factory and ordinarily does not require readjustment.

5. When removing a part, be very careful not to damage or displace other parts. (Be especially careful with the guide poles and rotary video head drum.)
6. To check the mechanism without the cassette tape, disable the photo transistor sensors by covering them with opaque material. After completing checks and repairs, be sure to remove the covers.
7. Place a suitable weight on the cassette when operating without the housing.
8. To open the protective door of the cassette, press the small locking tab at the upper right corner of the cassette and open the hinged door manually. Since the tape becomes exposed, use care not to damage or soil it.

2.2 REQUIRED JIGS AND TOOLS

For proper mechanical adjustment, the following jigs and tools are strongly recommended. Without them, a long trial-and-error period would be necessary.

In addition, general-purpose tools and a set of metric hex keys (not supplied by JVC) are required.

The hex keys needed for this model are 1.5 and 2.4 mm in size.

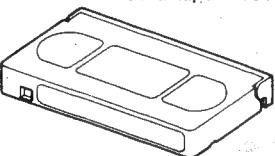
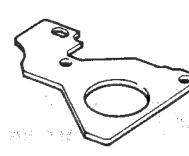
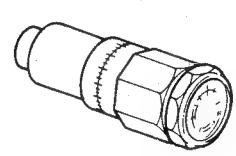
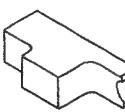
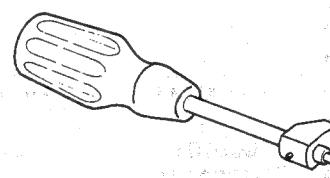
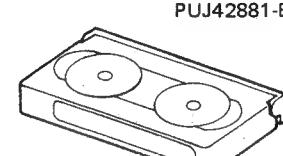
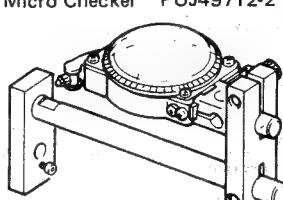
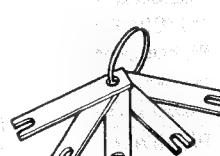
JVC Alignment Tape MH-2,8 MH-F8 Record tape E-180 	A/C Head Parallel Check Plate PUJ50204 	Height Gauge PUJ42147-2 	Master Plane Jig PUJ42146 
Torque Gauge Ass'y PUJ48075-2, -3 	T.U. Guide Height Gauge PUJ44650 	Audio/Control Head Position Tool PUJ44653 	
Cassette Torque Meter PUJ42881 PUJ42881-B 	Micro Checker PUJ49712-2 	Thickness Gauge PUJ48017 	

Fig. 2-1 Jigs and tools

2.3 LAYOUT OF MAIN MECHANICAL PARTS

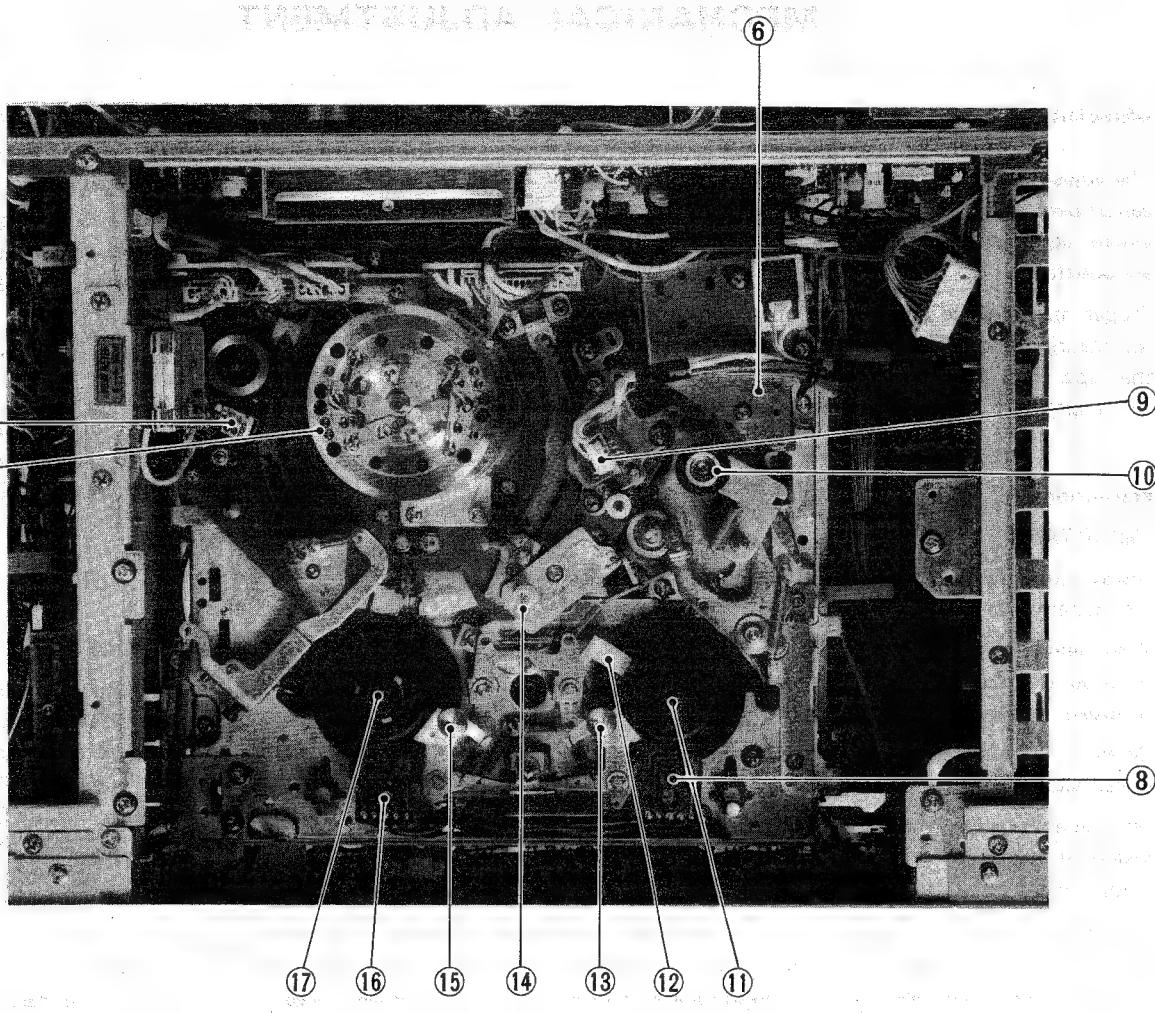


Fig. 2-2 Top view

Symbol No.	Part No.	Part Name	Description
1	PU54397	Full Erase Head	
2	PRD20022C	Upper Drum Ass'y	
3	—	—	
4	—	—	
5	—	—	
6	PGZ00093	Pinch Roller Solenoid	
7	—	—	
8	PU55701	Take-up Photo Interrappter	
9	PGZ00271	Audio/Control Head Ass'y	
10	PQ40137A	Pinch Roller Ass'y	
11	PGZ00094A-1	Take-up Reel Disk Ass'y	
12	PU50547A	B.T. Lever Ass'y	
13	PU50535B	Take-up Brake Ass'y	
14	GL-450V	Cassette LED	
15	PU50535A	Supply Brake Ass'y	
16	PU55701	Supply Photo Interrappter	
17	PGZ00095A-1	Supply Reel Disk Ass'y	

Table 2-1

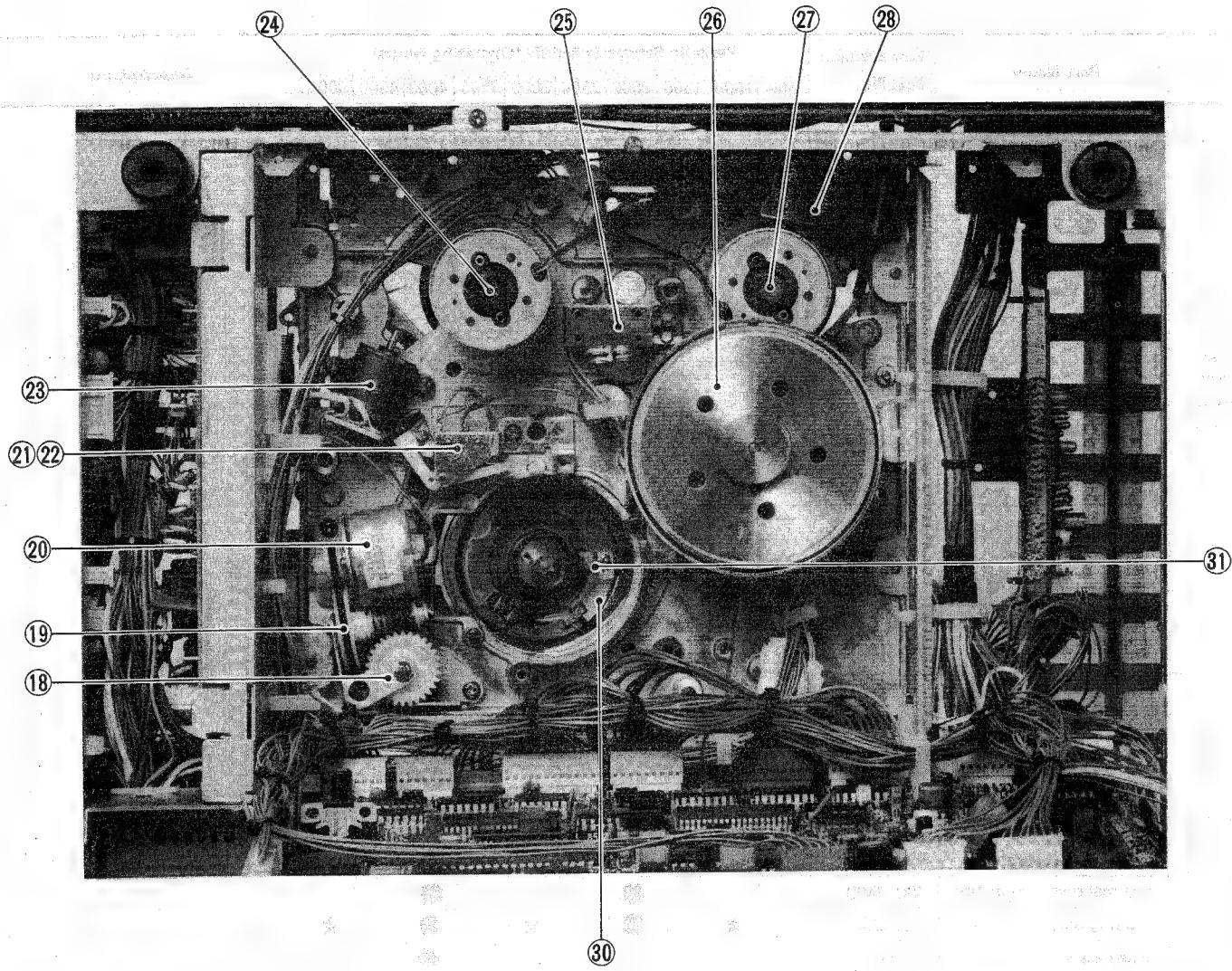


Fig. 2-3 Bottom view

Symbol No.	Part No.	Part Name	Description
18	PGZ00032A-1	Loading Drive Gear Ass'y	Incl. 19 and 20
19	PU50350	Loading Belt	
20	PU52745A	Loading Motor Ass'y	
21	QSM1S11-211	After Loading Switch	Chassis side
22	" -211	Unloading Switch	
23	PGZ00031	Differential Transformer Ass'y	
24	PU50531-2	Supply Reel Motor	
25	PGZ00091	Back Tension Solenoid	
26	PGZ00026-001-1	Capstan Motor	
27	PU50531	Take-up Reel Motor	
28	PGZ00092	Brake Solenoid	
29	-	-	
30	PRD20003D	Lower Drum Ass'y	
31	PGZ00137-2	Brush Ass'y	

Table 2-2

2.4 PERIODIC MAINTENANCE

	Part Name	Replacement Part No.	Periodic Service Schedule (Operating Hours)										Description
			500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape transport system	Tension pole		★	★	★	★	★	★	★	★	★	★	
	SUP slant pole		★	★	★	★	★	★	★	★	★	★	
	SUP guide roller												
	SUP guide pin												
	SUP guide pole												
	SUP impedance roller												
	SUP brake												
	Capstan												
	T.U brake												
	T.U guide roller												
	T.U slant pole												
	T.U guide pole												
Drive system	Full erase head	PU54397	★	★	★	★	★	★	★	★	●		
	A/C head ass'y	PGZ00271	★	★	★	●	★	★	★	●	★	★	
	Upper drum ass'y	PRD20022C	★	●	★	●	★	●	★	●	★	●	
	Lower drum motor ass'y	PRD20003D	★	★	★	★	★	★	★	★	○	●	
	Pinch roller	PQ40137A	★	★	★	●	★	★	★	●	★	★	
Others	SUP reel motor	PU50531-2				●				●			
	T.U reel motor	PU50531				●				●			
	Capstan motor ass'y	PGZ0026-001-1								●			
	Cassette housing motor	PQ40090A									●		
	Loading motor	PU52745A									●		
	S. reel disk rubber tire	40033400				●				●			
	T.U reel disk rubber tire	40033400				●				●			
Others	Loading belt	PU50350	★			●		★		●		★	
	Brush ass'y	PGZ00137-2								●			
	Commutator ass'y	PQ41596A				●				●			
	Hour meter	PU44629		●		●		●		●			

Note: Upper drum life is influenced by the operating conditions.

Key to abbreviations: ★ : Cleaning

○ : Check

● : Replacement

Table 2-3 Periodic maintenance

2.5 MAIN ASSEMBLY REPLACEMENT

As necessary to allow replacement, remove external covers, circuit boards, shield covers, cassette housing, etc.

2.5.1 Cassette housing and cassette motor

Note: Avoid operating the slide plate within with fingers, etc. when dismounting the cassette housing without using a cassette. Danger is involved when the reinforcement touches the roof plate at the time of cassette loading.

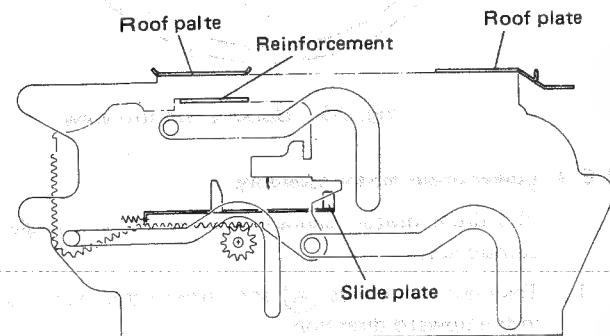


Fig. 2-4 Cassette housing

[A] Cassette housing removal

1. Disengage the connector from the cassette housing board.
2. Remove the cassette housing in the upward direction while the position of slanting the panel toward you.
3. Take out the four screws ① and the two screws used with the front panel up mounting.

Note: To operate mechanism after removal of the cassette housing, refer to "Mechanism functions".

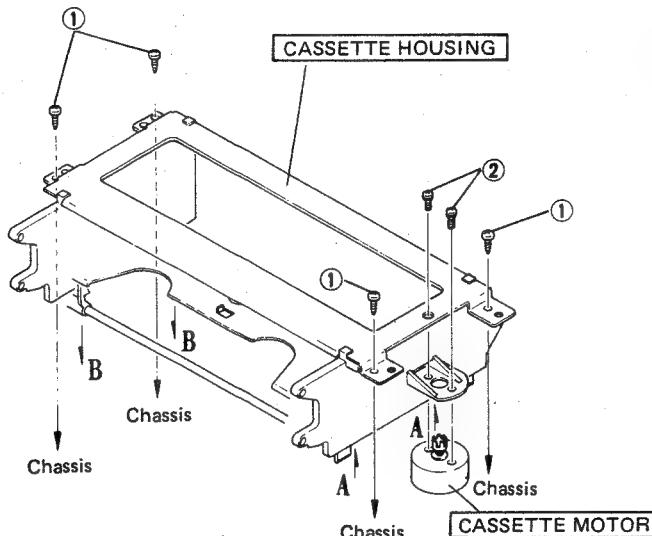


Fig. 2-5 Cassette housing removal

● Mechanism functions

- 1) Put the cassette housing on the hinter bracket with the surface downward as shown in Fig. 2-6. At this time, do not disengage the connector from the cassette housing board.
- 2) Insert a cassette into the housing. The housing mechanism functions to retract the cassette.
- 3) Since the required sensors are contained within the housing, after the cassette has been retracted, the desired modes can then be set by using the operation switches.

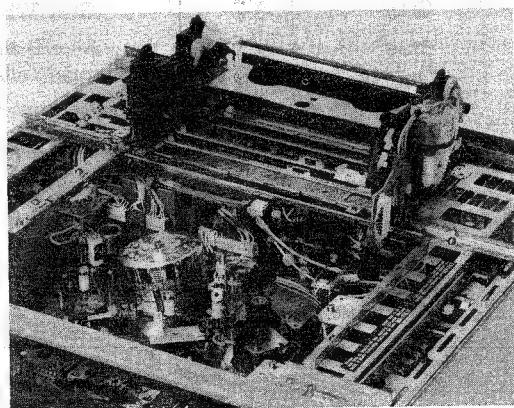


Fig. 2-6 Mechanism functions

[B] Cassette motor

1. Remove the cassette housing. Unsolder the two wires from the cassette motor.
2. Take out two screws ② and remove the cassette motor.
3. Replace the cassette motor and reassemble by reversing the above steps. Use care regarding the motor wires polarity.

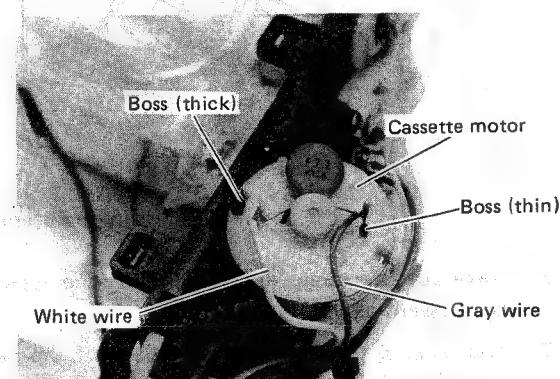


Fig. 2-7 Cassette motor wiring

2.5.2 Upper drum

1. Unsolder the twelve wires connecting the lower drum from the relay pins of the upper drum (perform quickly to avoid damaging the wires).

Relay Pin Color	Channel	Wire Color Inner/Outer
Brown	V-1	Brown/Green
Red	V-2	Red/Clear
Gray	A-1	Violet/Light green
Gray	A-2	Gray/White
Blue	V-1'	Blue/Black
Orange	V-2'	Orange/Yellow

Table 2-4 Upper drum wiring

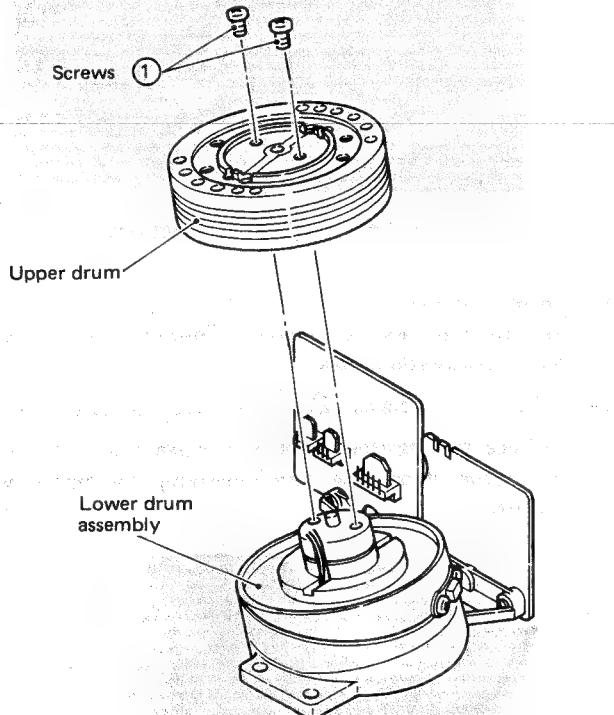


Fig. 2-8 Upper drum replacement

2. Take out two screws ① and remove the upper drum in the upward direction.
3. Use alcohol to clean the lower face of the new upper drum and the upper face of the lower drum.
When handling and installing the new upper drum, avoid directly touching the video heads and use care not scratch the drum.
4. Reassemble by reversing the above steps. When resoldering, observe the correct channels (refer to Table 2-4) and avoid overheating the wires.
5. After completion of replacement, perform the following upper drum eccentricity adjustment (refer to section 2.5.4).

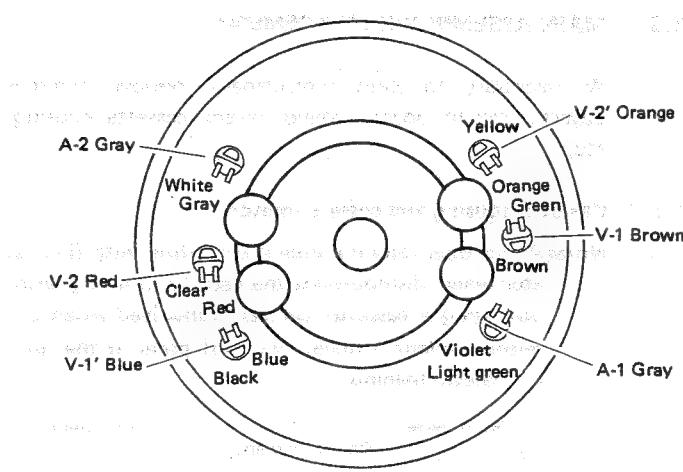


Fig. 2-9 Upper drum top view

2.5.3 Lower drum motor assembly

The drum motor, cannot be replaced as a single motor component.

1. Take out the screws A and remove the drum assembly, in the upward direction.
2. Remove the upper drum assembly.
3. Replace a new lower drum motor assembly, reassemble by reversing the above steps. Use care not to damage the assembly.
4. After completion of replacement, perform the following upper drum eccentricity adjustment (refer to section 2.5.4).

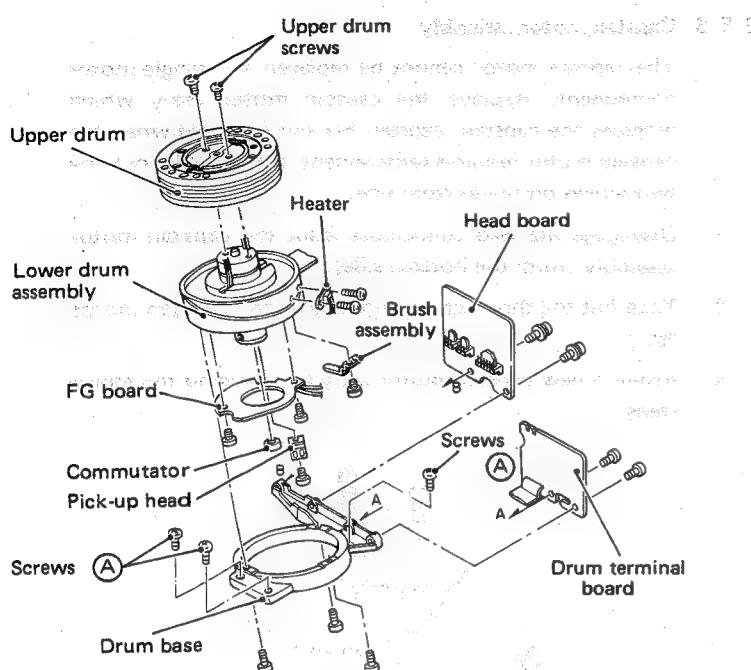


Fig. 2-10 Lower drum motor assembly

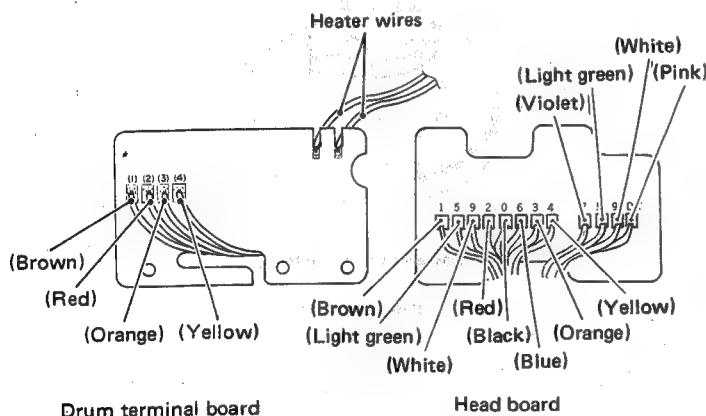


Fig. 2-11 Drum terminal board and Head board

2.5.4 Upper drum eccentricity

- If the upper drum is mounted even slightly out of center with respect to the drum shaft, relative head-to-tape speed becomes inconsistent within the rotation period of the upper drum. This can cause jitter and picture distortion.
 - After the upper drum is replaced, perform the following adjustments.
- Set the operation preset and then set for the Play mode.
 - After completion of loading, switch off the power.
 - Set the micro-checker (PUJ49712-2) on the guide pin as shown in Fig. 2-12. Use the accessory hex wrench (metric) to tighten the fixing screw.

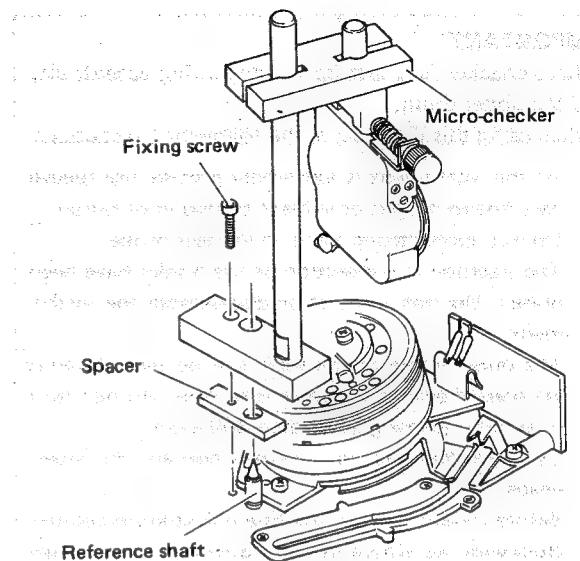


Fig. 2-12 Micro-checker mounting

- Gradually turn the fine adjust knob clockwise so that the dial indicator registers zero on the scale. Adjustment of ± 10 scale divisions is possible on the outer frame, but do not turn more than that.
- While using care not to apply lateral pressure to the drum, slowly turn the upper drum and read the deviations indicated by the micro checker. Check for needle deflection within 2 microns (± 1 microns).
- If deviation is greater than 2 microns, turn the fine adjust knob counterclockwise to disengage the test probe from the drum. Loosen the 2 screws of the upper drum, carefully adjust the position, then retighten the 2 screws in a balanced manner. Afterwards, again use the micro-checker to check the eccentricity.
- After using, turn the fine adjust knob counterclockwise and remove the micro-checker.
- Supply power and set for the Stop mode. Be sure to remove the cover.
- Connect oscilloscope to TP-7 of the Pre/Rec board.
- Gradually turn the TRACKING control and confirm simultaneously maximum CH-1 and CH-2 waveforms.
- If difference is obvious, remove the upper drum, clean the bottom face of the upper drum and the lower drum flywheel. Reinstall and repeat above steps 1 to 10.

IMPORTANT:

Micro-checker is a test jig for measuring eccentricity of the upper drum.

When using this jig, observe the following precautions.

- As the instrument is extremely precise, use special care not to drop it or subject to strong vibration.
- Do not apply strong force to the test probe.
- The position and direction of the holder have been preset. Do not readjust or disassemble the instrument.
- The outer frame of the scale can be turned about 10 scale divisions in either direction. Do not turn it forcibly (force greater than 300 g-cm).
- Use care that the jig does not contact the video heads.
- Before mounting, turn the fine adjust knob counter clockwise (to where the spring tension is no longer felt).
- When mounting, observe that the test probe movement direction is toward the center portion of the upper drum.
- If an abrasive sound is heard during measurement, check for dust or grit adhering to the test probe or drum face.
- Do NOT apply power while the jig is installed.

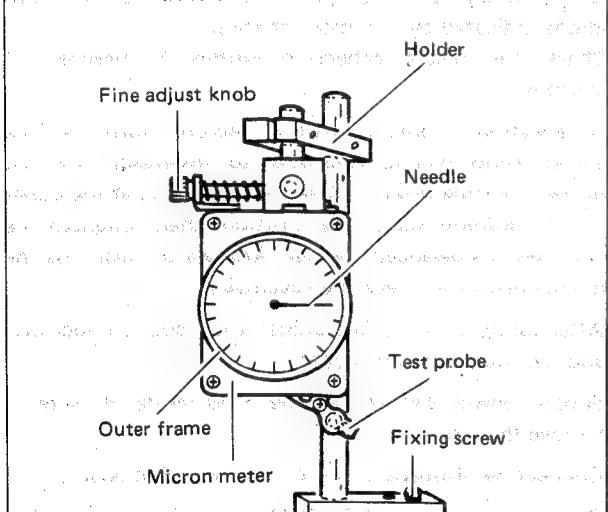


Fig. 2-13 Micro-checker

2.5.5 Capstan motor assembly

The capstan motor cannot be replaced as a single motor component. Replace the capstan motor ass'y which includes the capstan, capstan FG and flywheel when the capstan motor requires replacement. Do not take out the two screws on the bottom side.

1. Disengage the two connectors from the capstan motor assembly (from the bottom side).
2. Take out the three screws and remove the capstan motor ass'y.
3. Install a new capstan motor ass'y by reversing the above steps.

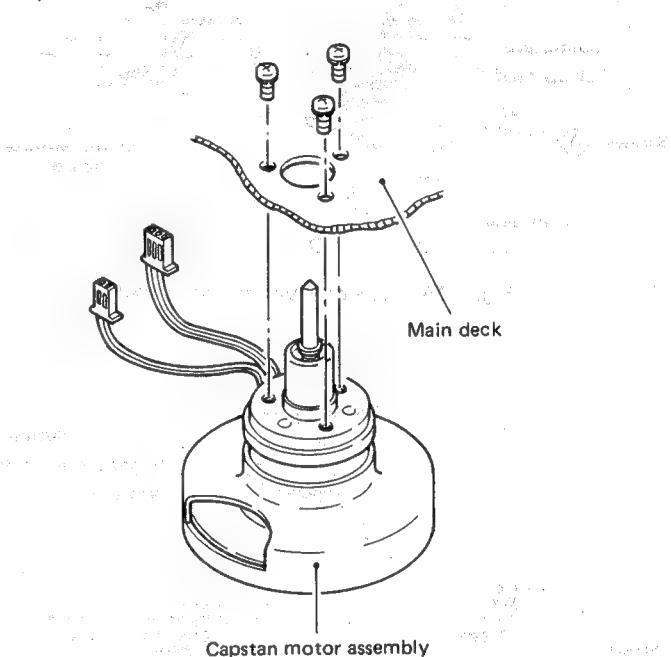


Fig. 2-14

2.5.6 Supply reel motor

Note: As the setscrew position is under the reel disk, it's a little bit tough to loosen the screw due to the front panel obstruction.

Front panel removal might be recommended.

1. Remove the cassette housing ass'y (section 2.5.1).
2. Take out the screw and E-ring then remove the supply reel FG board and supply brake temporarily.
3. Loosen the setscrew with 1.5 mm hex. wrench and remove the supply reel disk ass'y in the upward direction.
4. Disengage the connector, from the reel motor (from the bottom side).
5. Take out the four motor screws and remove the supply reel motor.
6. Install a new supply reel motor and reassemble by reversing the above steps.
7. Perform the reel disk height adjustment (section 2.6.2).

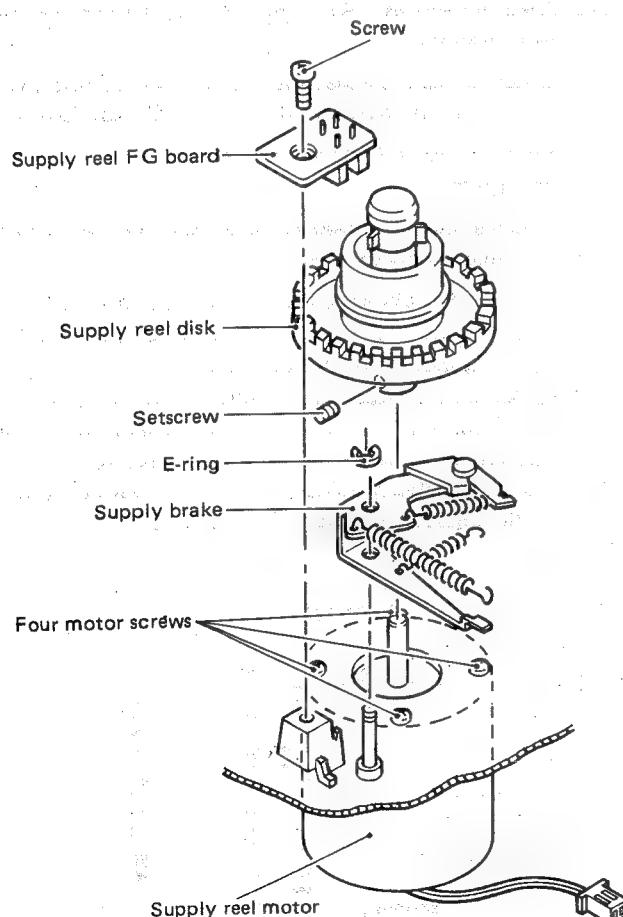


Fig. 2-15

2.5.7 Take-up reel motor

Note: Before loosen the setscrew of takeup reel desk, the right side panel and the regulator PWB would be removed due to loosen the screw easier.

1. Remove the cassette housing ass'y (section 2.5.1).
2. Take out the screw and two E-rings, then remove the take-up reel FG board, loading tension lever and take-up brake temporarily.
3. Loosen the setscrew and remove the take-up reel disk ass'y in the upward direction.
4. Loosen the two screws and temporarily remove the brake solenoid.
5. Disconnect the connector from the take-up reel motor.
6. Take out the four screws and remove the take-up reel motor.
7. Install a new take-up reel motor and reassemble by reversing the above steps.
8. Perform the reel disk height adjustment (section 2.6.2).

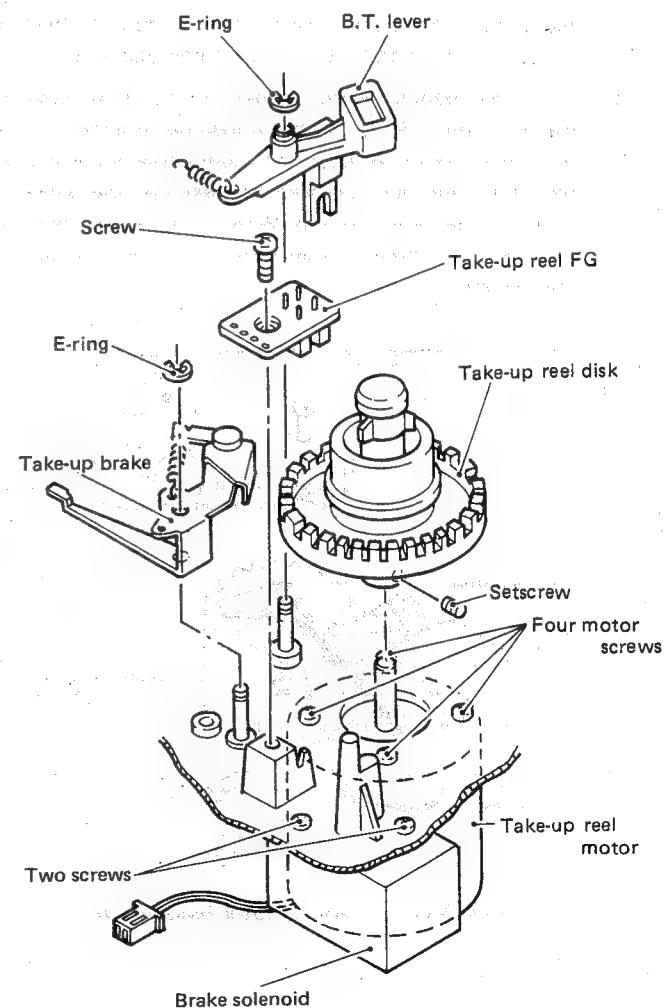


Fig. 2-16

2.5.8 Loading drive gear assembly/loading motor

Note: Before replacing the loading motor, carefully observe its mounting condition (particularly wire polarities, positioning and clamping).

1. Take out the two screws **(A)** and remove the loading drive gear assembly.
2. Unsolder the wires from the motor terminals.
3. To replace loading drive gear assemblies, place a new assembly by reversing the above steps and proceed to 7 below and after. In case of motor replacement, proceed to 4 below.
4. Disengage the belt from the pulley, take out the two screws **(B)** and remove the motor from the loading gear assembly.
5. Loosen the setscrew and remove the motor pulley.
6. Place a new loading motor and reassemble by reversing the above steps. At the time, use care as to wire polarities. Use a 0.5 mm thickness gauge to mount the motor pulley.
7. Move the pole base on the subdeck by hand to the loading end position and install the loading gear assembly.
8. Turn the loading motor pulley by hand to move the loading ring slightly in the unloading direction. Check for equal spacing between the supply pole guide and supply pole base, and between the take-up pole guide and take-up pole base. See Fig. 2-18. If not equal, the loading gear ass'y mounting position is incorrect. Repeat the above step 7.

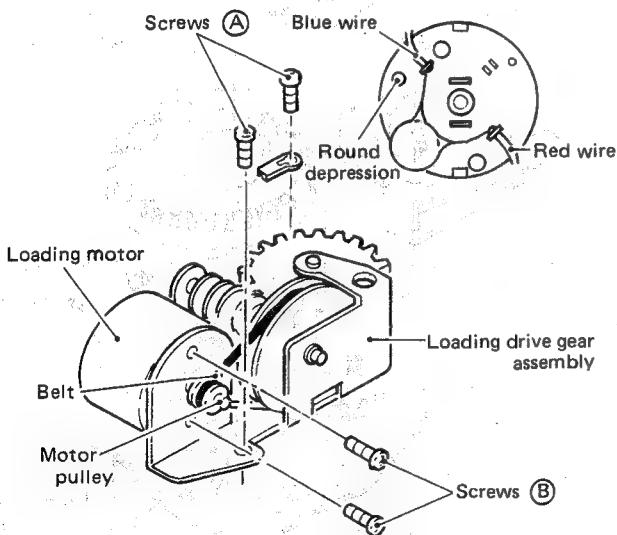


Fig. 2-17 Loading motor replacement

Supply pole guide

Take-up pole guide

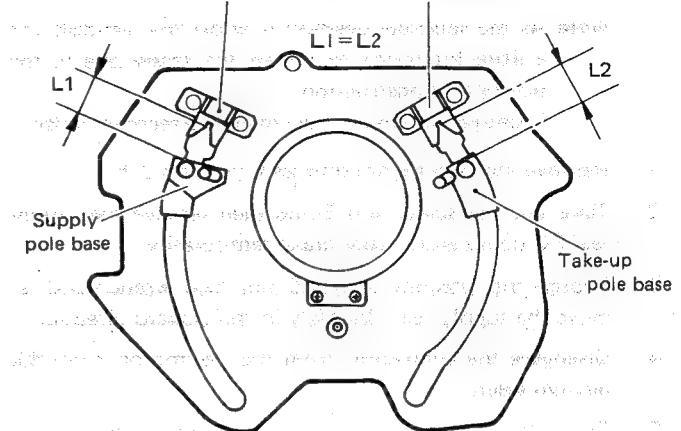


Fig. 2-18 Loading ring check

2.5.9 Audio/control (A/C) head assembly

1. Take out screws **(A)**, **(B)** and **(C)** to remove the A/C head assembly.
- Note:** Use care so that the coil springs do not come off from the bottom side of the A/C head assembly.
2. Remove the A/C head circuit board. Use care not to damage the wires.
 3. Replace the A/C head subassembly and reassemble by reversing the above steps.
 4. Perform the following checks and adjustments.
- 1) Audio/control head parallel (refer to section 2.6.11)
 - 2) Tape transport (refer to section 2.7)
 - 3) Audio/control head height (refer to section 2.8.4)
 - 4) Audio/control head azimuth (refer to section 2.8.5)
 - 5) Audio/control head position (refer to section 2.8.7)
 - 6) Interchangeability adjustment (refer to section 2.8.2)
 - 7) Audio adjustment (refer to section 3.9).

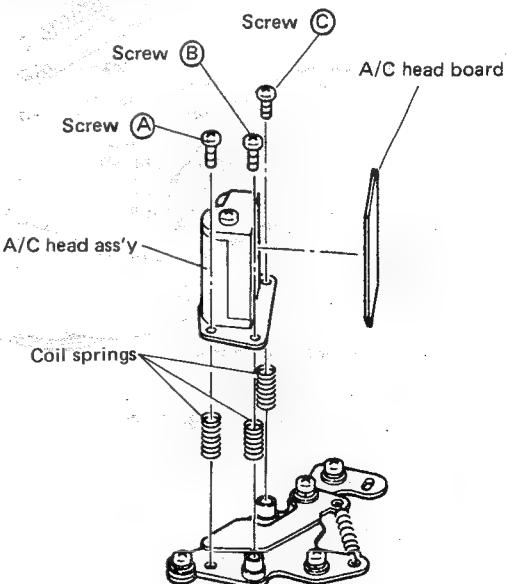


Fig. 2-19 A/C head replacement

2.6 CHECKS AND ADJUSTMENT

2.6.1 Master plane jig setting

1. Remove the cassette housing assembly.
2. As shown in Fig. 2-20, position the master plane jig with respect to the reference shaft, pinch roller shaft and the stud.

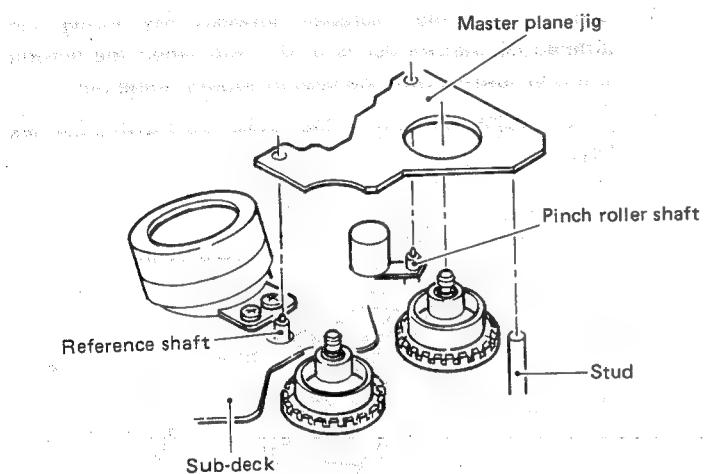


Fig. 2-20 Master plane jig setting

2.6.2 Reel disk height

1. Set the master plane jig.
2. Use the height gauge (PUJ42147-2) to confirm that the reel disk height. Measure at 2 places 90° apart. When measuring, press the reel disk downward to compensate for mechanical play.
3. The correct height is between planes A and B, as shown in Fig. 2-21. If necessary, loosen the setscrew and adjust to the correct height.

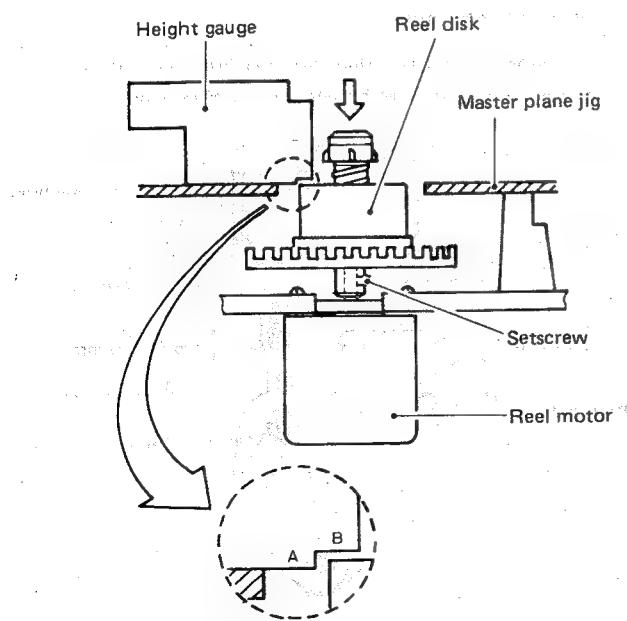


Fig. 2-21 Reel disk height adjustment

2.6.3 Supply guide pole height

1. Set the height gauge (PUJ42147-2) on the subdeck and check the perpendicularity.
2. Confirm that the height of the lower face of the upper flange. Then tighten the nylon nut by one turn from completion of adjusting position.
3. If guide pole height has been adjusted, tape transport adjustments are required (refer to section 2.7).

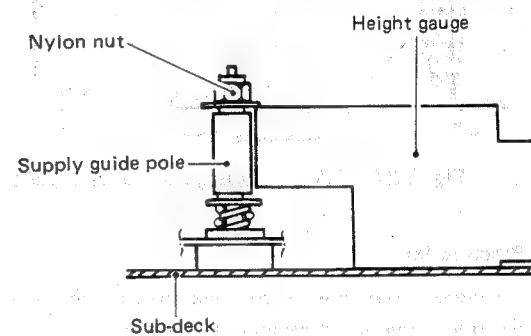


Fig. 2-22 Supply guide pole height adjustment

2.6.4 Take-up tape guide roller height

1. Set the master plane jig. Use the height gauge (PUJ44650) to confirm that the height of the lower face of the upper flange.
2. If necessary, loosen the setscrew on the lower part, then adjust the height by turning the screw on the top.
3. If the height has been adjusted, tape transport adjustments are required (refer to section 2.7).

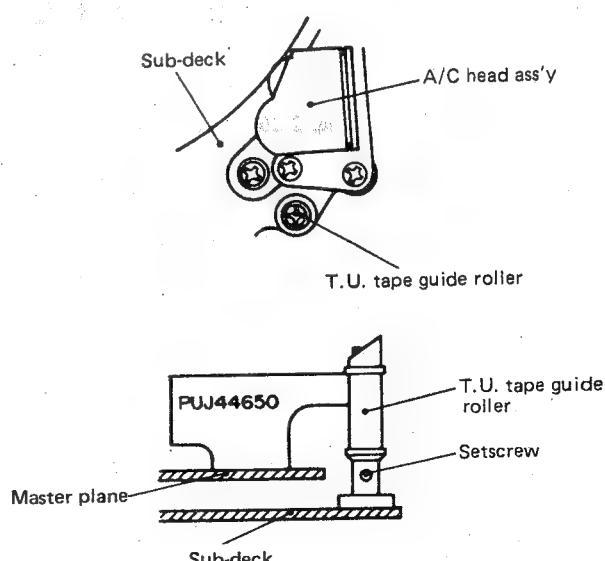


Fig. 2-23 Take-up tape guide roller height adjustment

2.6.5 Take-up tape guide roller parallel

1. Put the place surface of A/C head parallel check plate against the capstan shaft and take-up guide roller.
2. Check that the parallel degree between the capstan shaft and take-up tape guide roller is less than 0.05 mm.

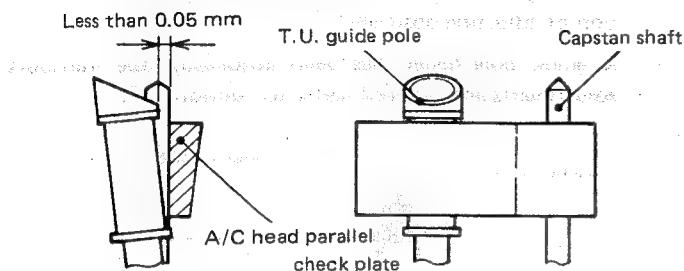


Fig. 2-24 Take-up tape guide roller parallel

2.6.6 Pinch roller

1. By hand, press the pinch roller toward the arrow A to the point where it contacts the capstan.
2. Check that the parallel degree between the pinch roller and capstan is less than 0.05 mm.

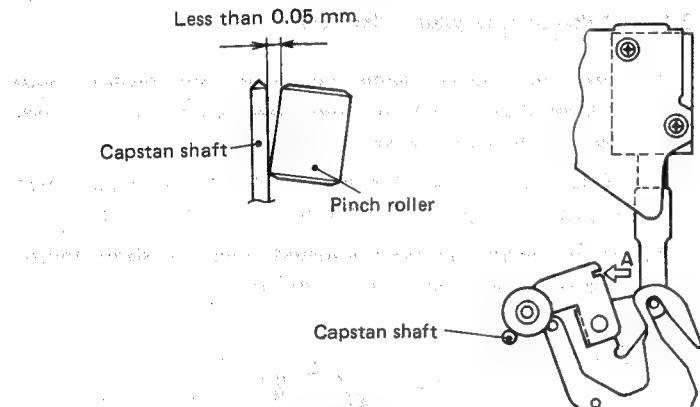


Fig. 2-25 Pinch roller

2.6.7 Differential transformer positioning

Note: The clearance is more easily checked from the bottom side.

1. Referring to section 2.5.1, use a cassette tape, supply power and set for the Play mode.
2. Turn off the power after completion of loading.
3. Confirm that the clearance between the E-ring and differential transformer is $0\sim0.1$ mm when the tension arm is in contact with the base of supply guide pin.
4. If not, adjust by turning the socket bolt with a 2.4 hex key.

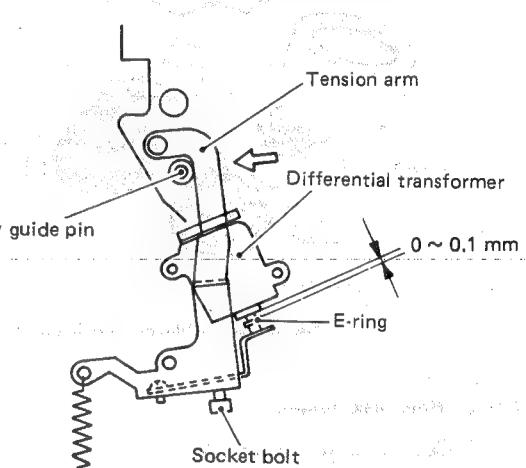


Fig. 2-26 Differential trans.

2.6.8 Pinch roller solenoid

1. Referring to section 2.5.1, insert a cassette tape, supply power and set for the Play mode.
2. Confirm that the space between the solenoid lever and spring is $0.5\sim1$ mm.
3. If necessary, adjust solenoid position by loosening the two screws, then tighten the two screws again.

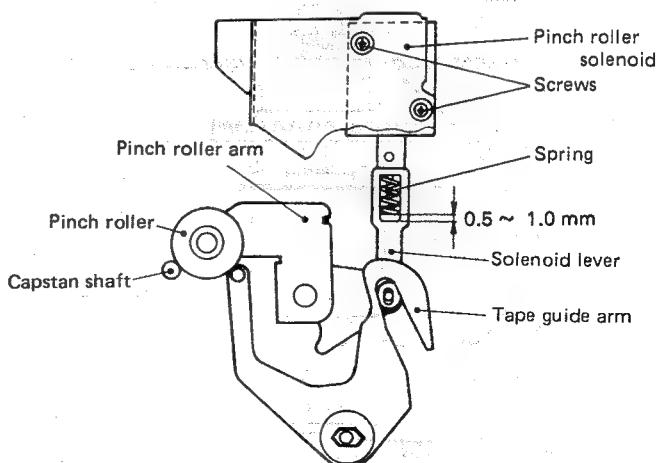


Fig. 2-27 Pinch roller solenoid

2.6.9 Photo interrupter

1. Insert a cassette tape, supply power and set for the Stop mode. Turn off the power in the state of half loading.
2. Confirm that the space between the drum and tape is $0.5 \sim 1.5$ mm.
3. If necessary, remove the cassette and adjust the photo interrupter position by loosening the screw.

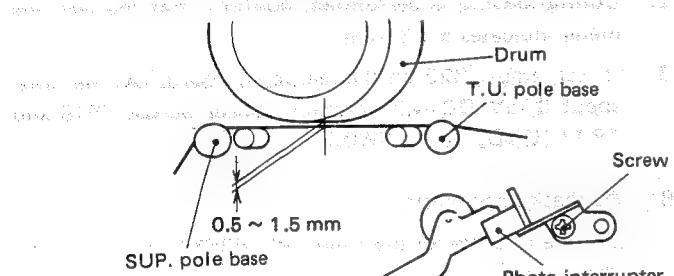


Fig. 2-28

2.6.10 Tension pole perpendicularity

1. Referring to section 2.5.1, insert a cassette tape, supply power and set for the Play mode. Turn off the power in this state.
2. Set the height gauge on the subdeck and press the tension arm toward the arrow B to the point where the tension arm contact the height gauge lightly.
3. Check that the perpendicularity degree between the tension pole and height gauge is less than 0.05 mm.

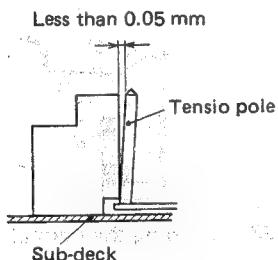


Fig. 2-29 Tension pole perpendicularity

2.6.11 Audio/control head parallel

1. Confirm the audio/control head parallel using the A/C head parallel check plate.
2. Put the A/C head parallel check plate against the audio/control head as shown in Fig. 2-30 and confirm that the degree of inclination is less than 0.1 mm as shown by A.
3. Put the plane surface of the plate against the audio/control head and check that there is no space in the upper portion as shown by B.

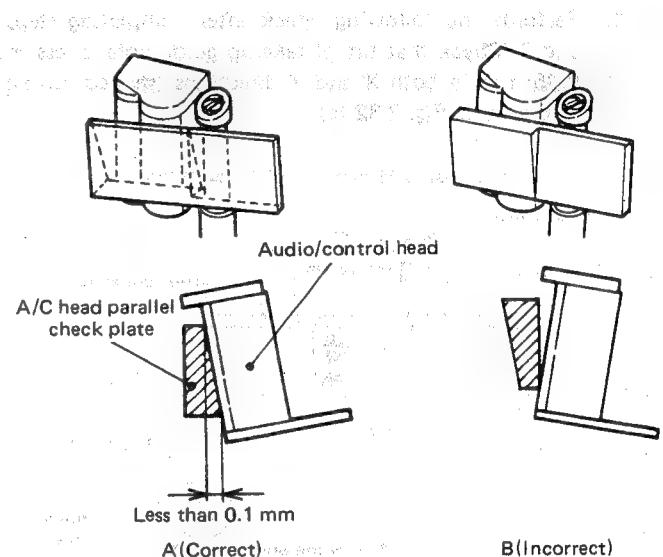


Fig. 2-30

2.6.12 Take-up guide pole height

1. Set the master plane jig. Use the height gauge (PUJ-44650) to confirm that the height of the lower face of the upper flange.
2. If necessary, adjust the height by turning the nut as shown in Fig. 2-31. (For the nut adjustment, it is required to remove the master plane jig once.)
3. If the height has been adjusted, tape transport adjustments are required (see section 2.7).
4. Next, play back the E-240 tape in the Search REV mode; and confirm that the beginning of the tape runs within the limit of the upper specification of the take-up guide pole and the end portion of the tape runs within the limit of the lower specification of the take-up guide pole.

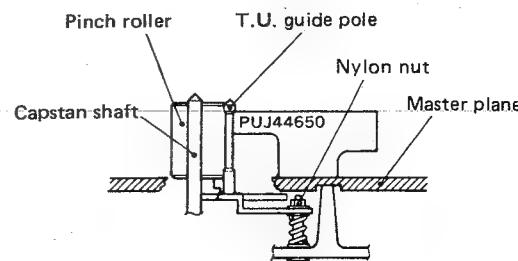


Fig. 2-31 Take-up guide pole height

2.6.13 Take-up guide pole perpendicularity

- Set the master plane jig. Use the height gauge (PUJ-44650) to measure at the two orthogonal places (X-Y') as shown in Fig. 2-32 (c).
- To measure at the Y' place, check that the perpendicularity degree between the take-up guide pole and height gauge is less than 0.05 mm as shown in Fig. 2-32 (a).
- In the same manner, check at the X place as shown in Fig. 2-32 (b).
- Perform the following check after completing steps 2 and 3. Check that tilt of take-up guide pole is less than 0.05 mm in both X and Y directions (shaded position) as shown in Fig. 2-32 (c).

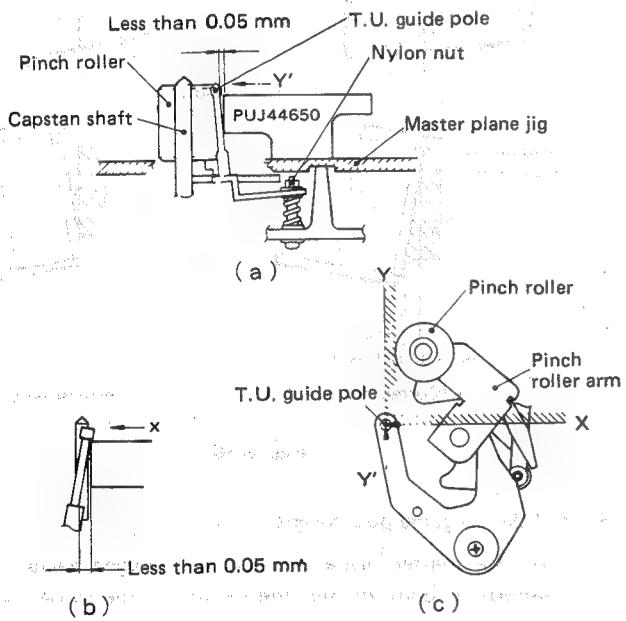


Fig. 2-32 Take-up guide pole perpendicularity

2.6.14 Torque adjustment

Perform the following checks and adjustment after completing reel servo adjustment section 3.5.

[A] Loading supply back tension

- Use PUJ42881 cassette torque meter and set for the Play mode.
- During loading is performed, confirm that the left side meter indicates 5 ± 3 g-cm.
- If not, adjust R29 on the reel servo board. (At the time, about 0 mV DC will normally appear across TP10 and TP-11 [GND] on the PWB.)

[B] Playback back tension

- Use the cassette torque meter (PUJ42881) and set in the Play mode.
- During the Play mode, check that the left side meter indicates 41 ± 5 g-cm and the TP-1 level of reel servo board is $0.31 \sim 0.36$ Vp-p. If not, perform the following steps.
- Perform 'Differential transformer positioning' (section 2.6.7) and 'Supply det. level' (section 3.5) adjustments.
- Using the cassette torque meter, set for the Play mode and adjust R167 of the reel servo board for 41 ± 5 g-cm.

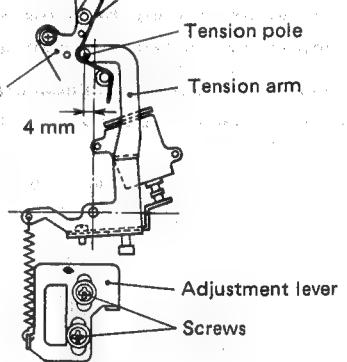


Fig. 2-33 Showing the normal state in Play mode.

- When 41 ± 5 g-cm back tension is obtained, confirm that the level at TP-1 of the reel servo board is $0.31 \sim 0.36$ Vp-p during the Play mode. If not, adjust the adjustment lever position carefully, then repeat steps 4 and 5 until the specified results are obtained.
- Figure 2-33 shows a normal state of the tension pole in the Play mode after completing the adjustment.
- Connect the oscilloscope to TP9 of the reel servo board and the heat sink of Q10 (power transistor) on the same board with its GND terminal. In the Still mode, confirm that voltage at TP9 of the reel servo board is 75 ± 5 mV. If not, adjust R145 of the reel servo board to obtain 75 mV.

[C] Playback take-up torque

1. Use the cassette torque meter (PUJ42881) and set for the Play mode.
2. During the Play mode, check that the right side meter indicates 100 ± 20 g-cm.
3. If not, adjust R142 of the reel servo board for 100 ± 20 g-cm.

Mode	Item	Adjusting Point	Indication
Loading	SUP Tension	R29	5 ± 3 g-cm
Play	SUP Tension	R167	41 ± 5 g-cm
	TU Torque	R142	100 ± 20 g-cm

Table 2-5 Torque setting chart

[D] Fast Forward (FF) and Rewind (REW) torque

1. Connect the oscilloscope to TP17 of the reel servo board and perform external synchronization at TP19 (pin 1 of IC4).
2. Set the beginning portion of E-180 tape, and enter the unit to the FF mode.
3. Confirm the peak voltage at TP17 is 4.8 ± 0.5 VDC at that time.
4. If it is not, adjust R128 of the reel servo board to obtain the standard value.
5. Lightly holding the torque gauge set to the take-up reel disk, enter the unit to the FF mode.
6. Turning the torque gauge gradually, read the point of the graduation when the needle and scale move simultaneously.
7. Confirm the torque of 430 gr-cm or more.
8. In the same manner as for the FF torque, confirm that REW torque is 430 gr-cm or more.

[E] Fast Forward (FF) and Rewind (REW) reel brake torque

Note: Photo sensors in the housing may detect light, at that time mode can not be accepted by the operation button. Keep any strong lights away.

1. Referring to section 2.5.1 "Mechanism functions", set a cassette tape and supply power.
2. Set for the STOP mode, then let the back tension lever, supply main brake and take-up main brake move toward the arrow C.
3. Set the torque gauge on the take-up reel disk. Relax the grip on the gauge so that the disk turns slowly in the direction of the arrow B. Read the indication at the point where the indicator and scale rotate at equal speed. The correct value is 25 ± 5 g-cm.
4. In the same manner, check the REW mode. Set the gauge on the supply reel disk and let the disk turn in the direction of the arrow A. The correct value is 25 ± 5 g-cm.

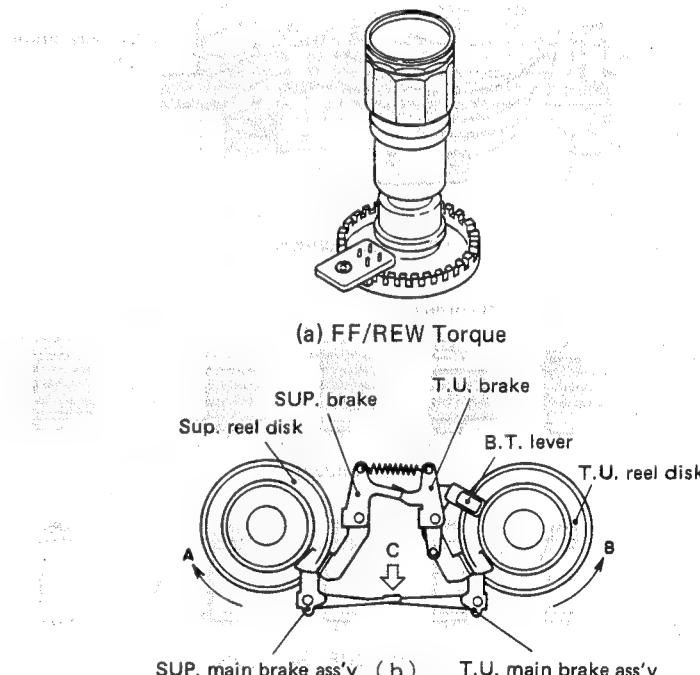


Fig. 2-34

[F] Search reverse tension

1. Set the video cassette torque meter (PUJ42881-B), and enter the unit to the Slow Search Reverse mode.
2. Confirm that supply side (left side) torque is 130 ± 15 gr-cm at a half ($x 1/2$) speed of the Search Reverse.
3. Next, at the normal ($x 1$) speed of the Search Reverse, confirm that back tension of the take-up side (right side) is 50 ± 6 gr-cm.
4. If it is not 50 ± 6 gr-cm, adjust R183 of the reel servo board to obtain it.

2.7 TAPE TRANSPORT

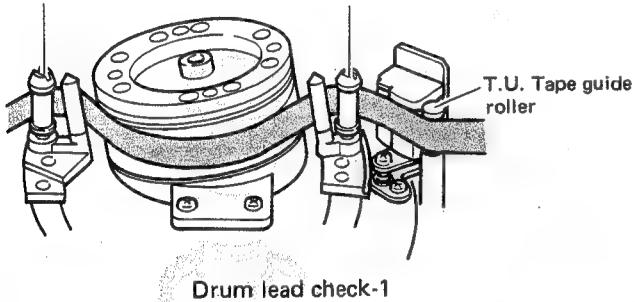
The tape transport system has been precisely adjusted at the factory and normally does not require readjustment. The following steps are therefore necessary only in case of severe usage or when replacing parts affecting the tape transport system.

2.7.1 Tape transport check

- Employ a E-180 tape and check at tape beginning and ending portion according to the following steps.
- Operate the machine between Play and Stop modes several times.

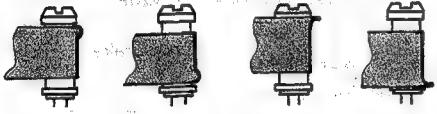
During Loading and Unloading, observe the tape at the supply, take-up and take-up tape guide rollers. Confirm absence of curling, wrinkling, etc.

SUP. Guide roller T.U. Guide roller



Drum lead check-1

Incorrect



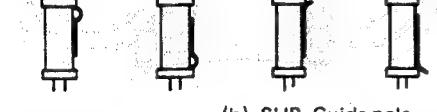
(a) Guide roller

Correct



(a) Guide roller

Incorrect



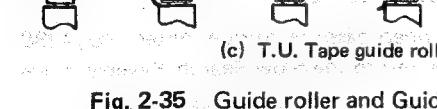
(b) SUP. Guide pole

Correct



(b) SUP. Guide pole

Incorrect



(c) T.U. Tape guide roller

Fig. 2-35 Guide roller and Guide pole

- Observe the tape when it wraps around the drum during loading and it separates from the drum during unloading. Confirm absence of damage to the tape and absence of contact noise at the drum lead.
- During the Play mode, observe the tape at the input and output portions of the drum lead. Confirm that the tape slips neither upward nor downward with respect to the lead.

SUP. Guide roller T.U. Guide roller

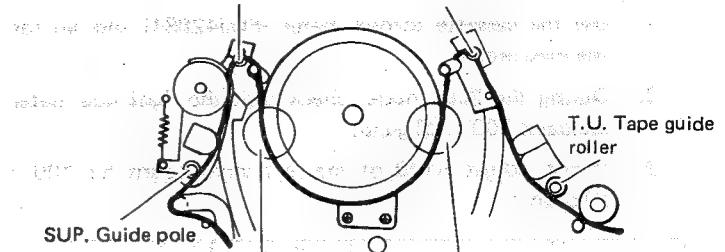


Fig. 2-36 Tape transport check

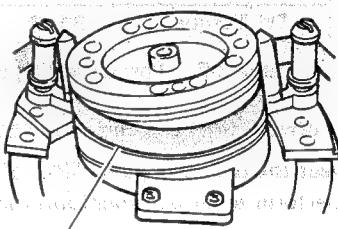


Fig. 2-37 Drum lead check-2

Notes:

- Slips upward : noise may occur by contact between tips of rotating heads and edge of tape.
- Slips downward: tape curls or wrinkles from contacting lead face (noise may also occur).
- During Play and FWD Search modes, observe the tape at the supply guide pole, supply guide roller, take-up guide roller and tape guide. Confirm absence of curling, wrinkling, etc. as shown in Fig. 2-35.
- During REV Search mode, confirm that the tape guide does not contact the tape and absence of curling, wrinkling, etc. at the supply guide pole, supply guide roller and take-up guide roller.
- At the time of switching between FWD Search and REV Search modes, observe the tape at the supply guide pole, supply and take-up guide rollers. Confirm absence of curling, wrinkling, etc.
- If necessary, perform adjustments according to section 2.7.2.
- Play back the tape in the condition that the supply tension pole is set by and tape tension is zero, and confirm that the tape has not been damaged or wrinkled by the take-up guide roller.
- Confirm that the tape has not been wrinkled by the take-up guide roller and take-up guide pole after a mode shift from REV (Search REV) to PLAY.

2.7.2 Tape transport adjustments

Note: Perform only if defects are noted during tape transport check (2.7.1).

If tape transport has been adjusted, interchangeability adjustment are required (see section 2.8).

[A] Guide roller height

1. The guide roller is fixed with a setscrew. Adjust the supply guide roller with respect to the drum input and the take-up guide roller with respect to the drum output.
2. Loosen the setscrew on the side to be adjusted. Loosen it only enough to allow the guide roller to be turned smoothly with a slotted screwdriver. Use care not to overloosen it.
3. Insert a cassette tape and set for the Play mode.
4. With a slotted screwdriver, turn the supply guide roller and adjust so that the tape travels smoothly in the drum lead.
5. Tighten the setscrew after completion of adjustment.

[B] Supply guide pole

Note: This adjustment must be within 0.5 mm (one nut turn is 0.5 mm) with respect to the height adjusted in section 2.6.3. If there is a large discrepancy, check the height of the supply reel disk, tension pole and other mechanical components.

1. Use a cassette tape and set for the Play mode.
2. Use a nut driver to adjust so that curling or wrinkling of the tape does not occur at the supply guide pole.

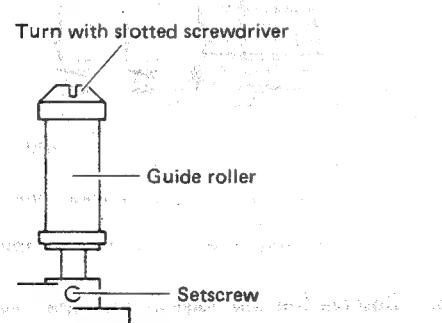


Fig. 2-38 Guide roller

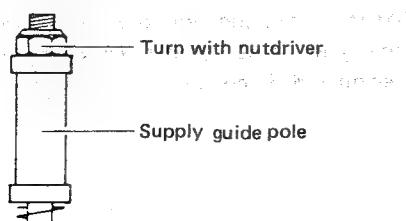


Fig. 2-39 Supply guide pole

[C] Take-up tape guide roller height

1. The take-up tape guide roller is fixed with a setscrew.
2. At the time of adjustment, loosen the setscrew only enough to allow the guide roller to be turned smoothly with a slotted screwdriver. Use care not to overloosen it.
3. Use a cassette tape and set for the Play mode.
4. Adjust by turning the top of the tape guide roller slightly with a slotted screwdriver so that curling or wrinkling of the tape does not occur at the take-up guide roller.
5. Tighten the setscrew after completion of adjustment.

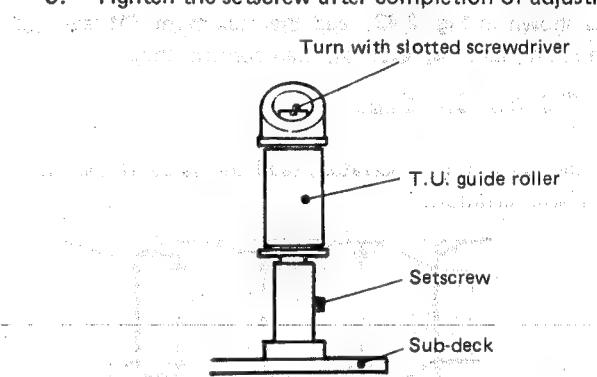


Fig. 2-40 Take-up tape guide roller

[D] Take-up guide pole height

Note: Since this height adjustment is seriously important to prevent tape damage, confirm absence of curling or wrinkling between the T.U. tape guide roller and capstan shaft at high speed REV Search mode is performed with a tape of E-180 type.

1. Use a cassette tape and set for the Play mode.
2. Use a nut driver to adjust so that curling or wrinkling of the tape does not occur at the take-up guide pole in all mode.

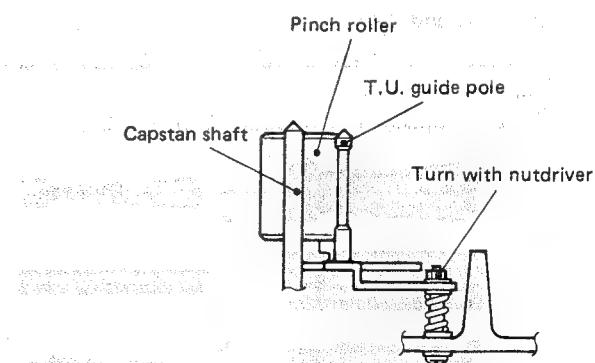


Fig. 2-41 Take-up guide pole

2.8 INTERCHANGEABILITY ADJUSTMENT

2.8.1 Preliminary checks

1. Connect the oscilloscope to PRE/REC TP-7

At this time, trigger the oscilloscope externally with the signal from D-PULSE of the drum servo board TP24.

2. Play staristep signal segment of the alignment tape MH-2.

3. Turn the tracking control and adjust for maximum FM output.

4. As shown in Fig. 2-42, read the maximum FM level (a) and minimum FM level (b), then confirm that:

$$\frac{b}{a} \geq 0.8 (\geq -2 \text{ dB})$$

If the waveform is serrated, read the value at the most uniform serrations.

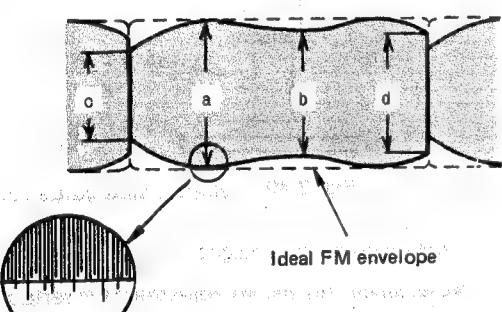


Fig. 2-42 FM waveform (max. output)

5. Read the values at points (c) and (d) [drum input and output] and confirm that:

$$\frac{c}{a} \geq 0.64 \text{ and } \frac{d}{a} \geq 0.64 (\geq -4 \text{ dB})$$

6. Turn the Tracking control from end to end. The waveform variation should be nearly parallel as shown in Fig. 2-43 and 2-44.

7. If steps 4 to 6 above are unsatisfied, adjustments are required.

Perform adjustments of section 2.8.2 to 2.8.9.

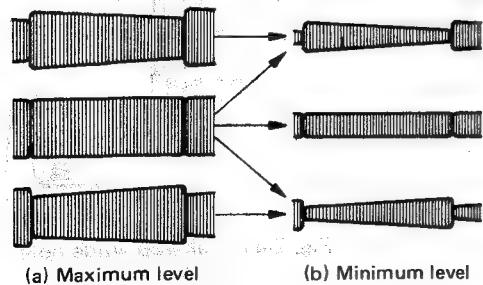


Fig. 2-43 Normal waveform examples

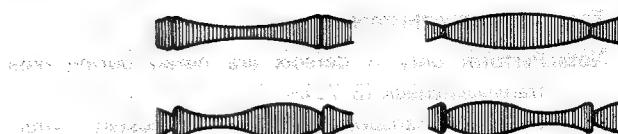


Fig. 2-44 Incorrect waveform examples

2.8.2 Preliminary adjustments

1. Connect the oscilloscope to PRE/REC TP-7.

Trigger the oscilloscope externally with the signal from D. PULSE of the drum servo board TP24.

2. Play staristep signal segment of the alignment tape MH-2.

3. Turn the Tracking control and adjust for maximum FM output.

- Drum input**
- Refer to Fig. 2-45. Examples of incorrect waveforms are shown by A and B. Adjust the supply guide roller so that the rising portion (drum input portion) of the waveform becomes flat as shown by C.

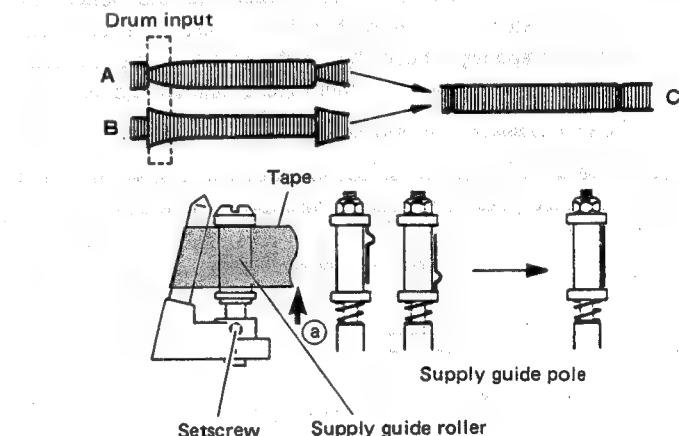


Fig. 2-45 Drum input adjustment

- Observe the top edge of the tape travels along the lower face of the upper flange and check the waveform does not fluctuate as the tape is lightly pushed up at point (a) as shown in Fig. 2-45.
- At this time, confirm absence of curling or wrinkling at the guide pole. If contact noise is heard, reconfirm section 2.6.3 and 2.7.

Drum output

7. In the same manner as for the drum input, turn the take-up guide roller to adjust the decay portion (drum output portion) of the FM waveform. Incorrect examples are shown by D and E in Fig. 2-46, while F indicates the correct adjustment.
8. Observe the top edge of the tape travels along the lower face of the upper flange and check the waveform does not fluctuate as the tape is lightly pushed up at point (b) as shown in Fig. 2-46.
9. At this time, confirm absence of curling or wrinkling at the take-up tape guide roller. If contact noise is heard, reconfirm section 2.6.4 and 2.7.
10. Carefully and evenly adjust screws A, B and C to align the audio/control head height with the tape as shown in Fig. 2-47.

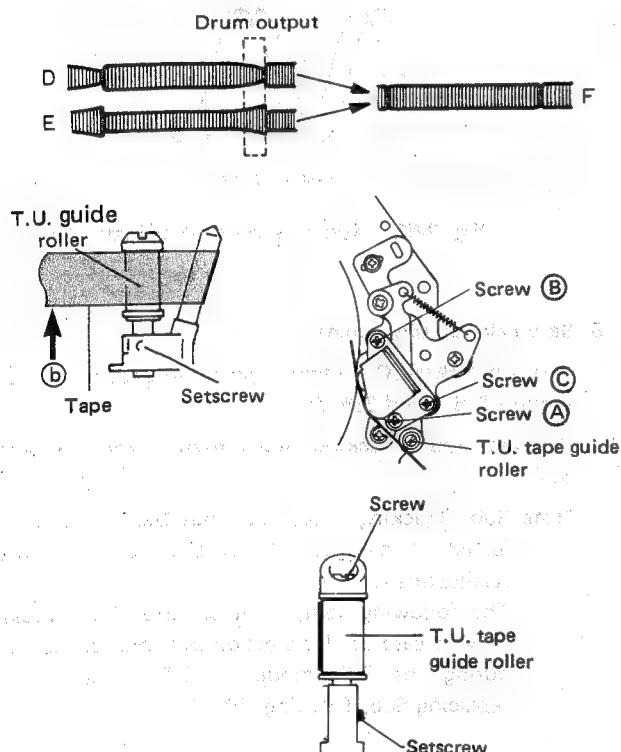


Fig. 2-46 Drum output adjustment

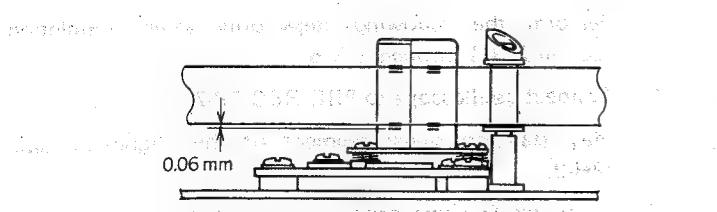


Fig. 2-47 Audio/control head height

2.8.3 Fine adjustment

1. After completion of preliminary checks, connect oscilloscope to PRE/REC TP-7. Observe FM waveform and adjust the Tracking control for minimum FM output level. Trigger the oscilloscope externally with the signal from D. PULSE of the drum servo board TP24.
2. If the waveform becomes as shown by A or B of Fig. 2-48, carefully adjust the supply guide roller height so that the waveform becomes as shown by E, F or G of Fig. 2-49.
3. If the FM waveform appears as shown by C or D in Fig. 2-48, carefully adjust the take-up guide roller height to obtain a waveform such as shown by E, F or G of Fig. 2-49.
- At this time, if the waveform fluctuates, adjust to the point of minimum fluctuation.
4. Vary the Tracking control from maximum to minimum FM output. The waveform variation should be nearly parallel as shown in Fig. 2-50. If not, readjust items in section 2.8.2 and 2.8.3.
5. Confirm the audio/control head height (section 2.8.4), azimuth (section 2.8.5) and audio/control head position (section 2.8.7).



Fig. 2-48 Minimum FM output (incorrect examples)



Fig. 2-49 Minimum FM output (correct examples)

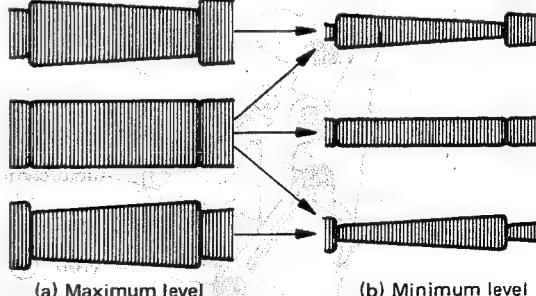


Fig. 2-50 Correct waveform

Note: Setscrew tightening

- After confirming absence of tape wrinkling and other transport irregularities, tighten the setscrews while in the Stop mode.
Since the guide rollers are easily moved, use care when tightening.
- Again perform the preliminary checks (refer to section 2.8.2).

2.8.4 Audio/control head height

1. Connect an oscilloscope to AUDIO OUT CH-1 and CH-2 terminals.
2. Play 1 kHz signal segment of the alignment tape MH-2.
3. Check that the audio CH-1 (LEFT) output level increase does not exceed 0.5 dB as the tape is lightly pressed down point (a) as shown in Fig. 2-51.
4. In the same manner, check that the audio CH-2 (RIGHT) output level increase does not exceed 0.5 dB as the tape is lightly pushed up at point (b).
5. If level increase is more than 0.5 dB in step 3 or 4, perform following adjustment.

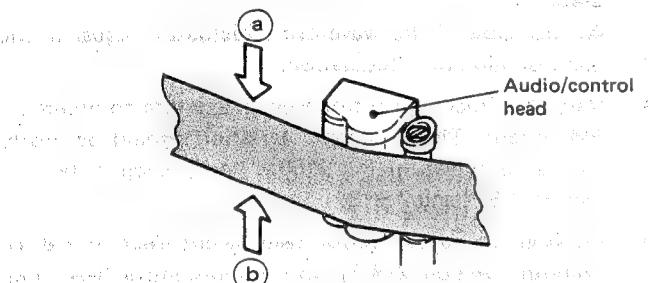


Fig. 2-51 Audio head height check

6. Connect CH-1 probe of the oscilloscope to LEFT (NORMAL) and CH-2 probe to RIGHT (NORMAL) of the AUDIO OUT terminals.
7. Adjust the oscilloscope for equal maximum levels for CH-1, when the tape is lightly pressed downward at point (a), and CH-2, when the tape is lightly pressed upward at point (b).
8. Turn screws (A), (B) and (C) in succession by small and equal increments at a time and adjust for the same levels between CH-1 and CH-2.
9. If tape curling, wrinkling, etc. occurs at the T.U. tape guide roller, reconfirm section 2.6.4 and 2.7.

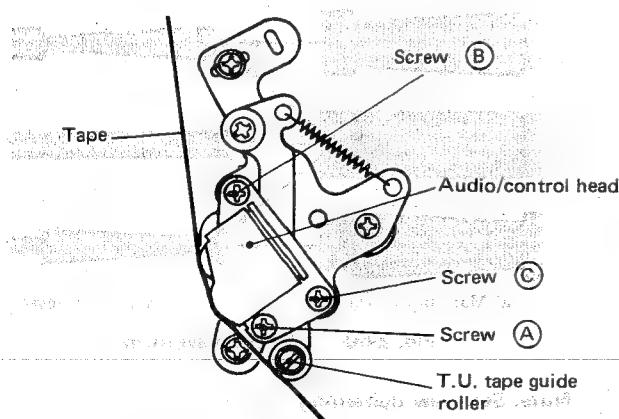


Fig. 2-52 A/C head height adjustment

2.8.5 Audio/control head azimuth

● Perform the following steps only after completing section 2.8.4.

1. Connect CH-1 probe of the oscilloscope to LEFT (NORMAL) and CH-2 probe to RIGHT (NORMAL) AUDIO OUT terminals.
2. Play 7 kHz signal segment of the alignment tape MH-2.
3. Adjust screws (A) and (B) (shown in Fig. 2-52) for both maximum output levels and absence of phase difference between CH-1 and CH-2.
4. Confirm the audio/control head height (section 2.8.4).

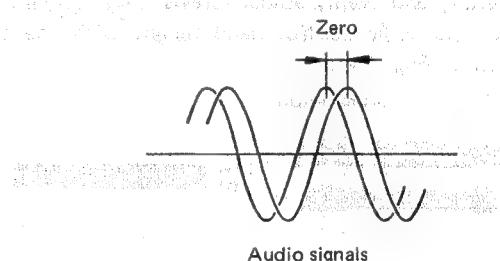


Fig. 2-53 Audio head phase adjustment

2.8.6 Servo circuit adjustment

1. Perform P.B./REC switching point adjustment (refer to section 3.6.6 and 3.6.7).
 2. Perform Sub Tracking adjustment (refer to section 3.7.7).
- Note:** Sub Tracking adjustment has been precisely adjusted at the factory normally does not require readjustment.
- The following adjustment are therefore necessary only in case of H distortion becomes produced by during the P.B. mode to E-E mode or when replacing Sub Tracking VR.

2.8.7 Audio/control head position

Perform the following steps only after completing section 2.8.1 through 2.8.5.

1. Connect oscilloscope to PRE/REC TP-7.
2. Play stairstep signal segment of the alignment tape MH-2.
3. Turn the Tracking control and confirm that the maximum FM level is obtained at the center click position.
4. If not, set the Tracking control to center click position.
5. Loosen the three screws (D, E and F) and slide the audio/control head assembly fully in the direction of the drum (indicated by the arrow) as shown in Fig. 2-48.
6. Slightly tighten the three screws (D, E and F) and play stairstep segment of the alignment tape MH-2.

7. Set the audio-control head position tool (PUJ44653) as shown in Fig. 2-55.

Slowly turn the tool and set the audio/control head assembly to the position where the second maximum peak FM level is obtained. See Fig. 2-56.

8. While using care not to slide the position of the three screws (**D**, **E** and **F**) of the audio/control head assembly.

9. Confirm section 2.8.1 through 2.8.6.

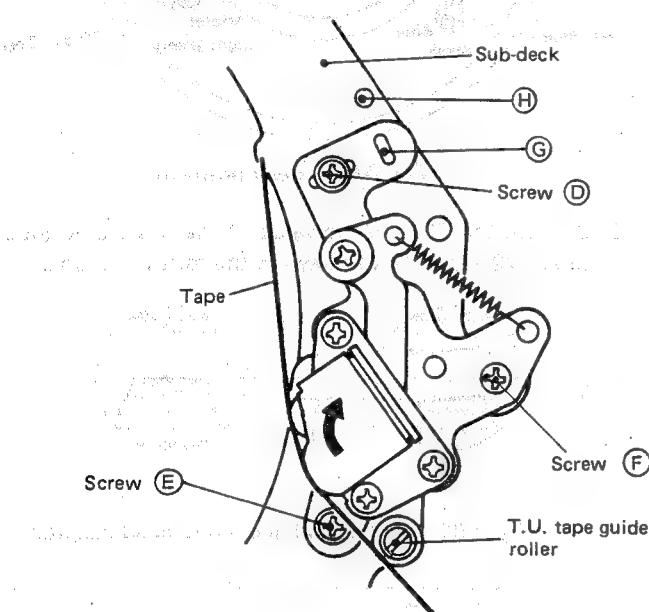


Fig. 2-54

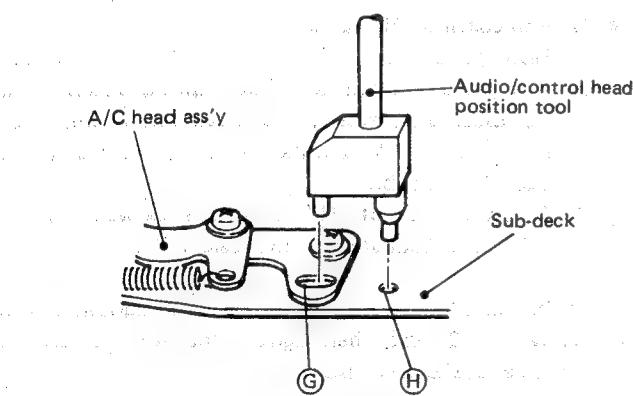


Fig. 2-55

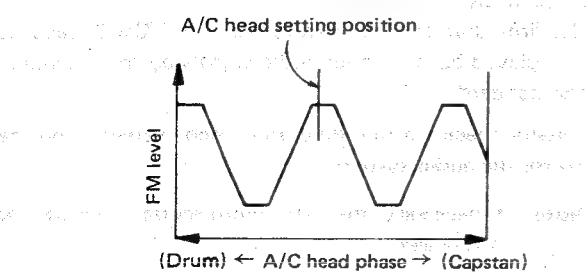


Fig. 2-56

2.8.8 Final checks

1. Reconfirm section 2.8.1.

If incorrect FM waveform, replace the upper drum assembly (refer to section 2.5.2).

2. Connect an oscilloscope to PRE/REC TP-7 and TP37 of the FM Audio board.

With dual trace mode, trigger the oscilloscope externally with signal from D. PULSE of the Front service terminal.

- 1) Play staircase signal segment of the alignment tape MH-2.

- 2) Set the trigger to + slope and observe the video FM waveform (CH-2).

- 3) Turn the Tracking knob to obtain the maximum video FM waveform.

At this time play carrier signal segment of the alignment tape MH-F8 and observe the audio FM waveform (b).

- 4) Turn the Tracking knob to obtain the maximum audio FM waveform (a).

Observe the audio FM waveform (a) and confirm that the level difference between audio FM waveform (b) and the maximum level (a) obtained manually is:

$$\frac{b}{a} \geq 0.9$$



Fig. 2-57 Audio FM output level

- 5) When the maximum video FM waveform, confirm the audio FM waveform (Fig. 2-58) obtained that:

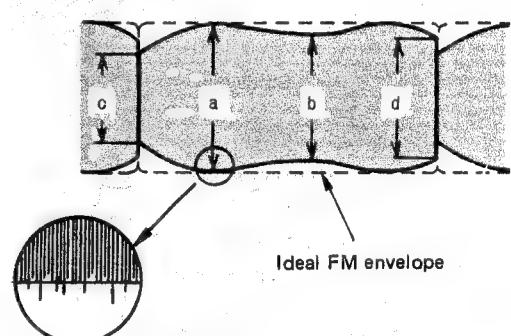


Fig. 2-58 FM waveform (max. output)

$$\frac{b}{a} \geq 0.8, \frac{c}{a} \geq 0.64, \frac{d}{a} \geq 0.64$$

(Specifications of audio FM waveform)

Note: If the FM dropout is noted, perform the FM audio switching point adjustment (refer to section 3.8.3) before confirmation.

- 6) Without audio signal, perform recording and then playback. Confirm the audio FM waveform (L-CH/R-CH) satisfied the specifications of audio FM waveform.

7) If FM waveform is still incorrect by the adjustments from the steps 1 through 5, replace the upper drum assembly (refer to section 2.5.2).

Note: Refer to section 2.8.9.

3. Perform overall checks and adjustments of the servo circuit and video, and then perform the audio circuit adjustment.

2.8.9 Reference

1. When audio FM waveform is not yet standardized after the final checks (section 2.8.8), a satisfactory result can be obtained by adjusting heights of the audio and video heads with a VH microscope (PUJ42990) used as an adjusting equipment.

2. Referring to section 2.5.1 set the machine into the operation preset condition for Play mode and then turn off the power.

1) Set the VH microscope (PUJ42990) on the guide pin as shown in Fig. 2-59.

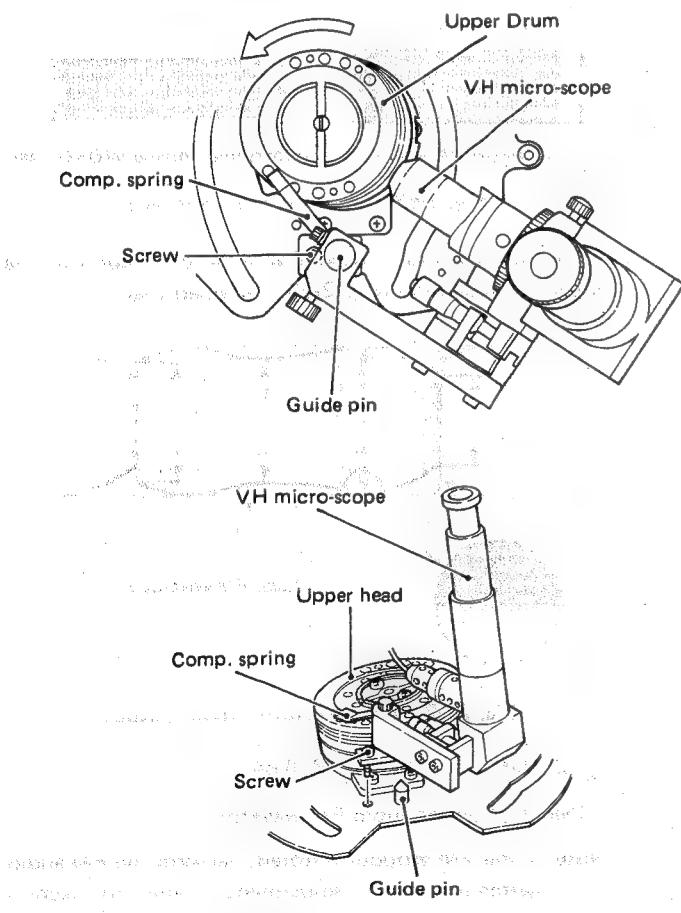


Fig. 2-59 VH microscope setting

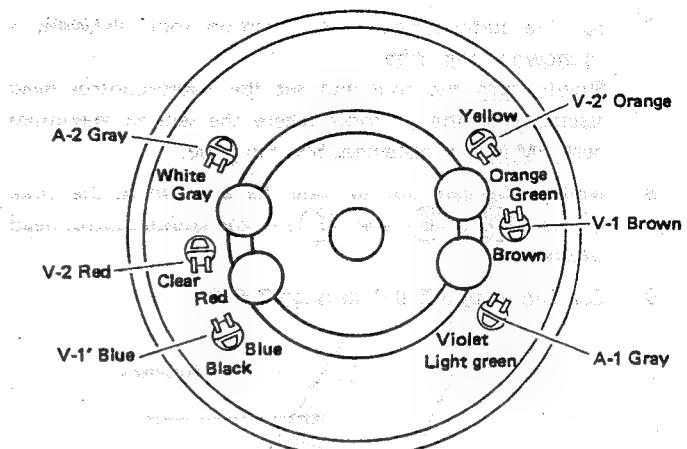


Fig. 2-60 Head position

2) Confirm that "H" of the value of the relative height between V2 and A1 is as shown in the following table.

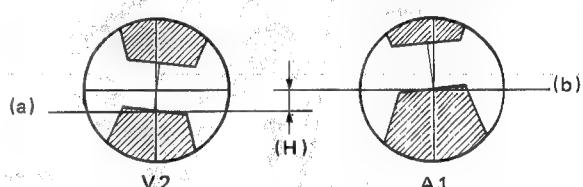


Fig. 2-61 Audio head and video head heights

A/V head	V2 - A1	V1 - A2	V1 - V2	A1 - A2
H	$42 \pm 5 \mu$	$42 \pm 5 \mu$	$0 \pm 1 \mu$	$0 \pm 1 \mu$

● How to confirm "H" value

- (1) Read the value of "a" of V2 on the VH microscope.
- (2) Lifting the rotation prevention spring upwards turn the upper drum slowly counterclockwise and stop it at the position A1 and fix the spring. At this position read the value (b).
- (3) Read the value of "H" (difference between "a" and "b"). (one graduation of the scale is 2μ)
- (4) If the value differs from the standard, tighten the setscrew of V2 first, then tighten the A1's setscrew to obtain a satisfactory result.
- (5) In the same manner as above, read the values and obtain satisfactory results for V1 - A2, V1 - V2 and A1 - A2, respectively.
- 6) Confirm that the FM waveforms (CH-1/CH-2) recorded and played back without audio signals by the machine are the standard.
- 7) Totally check up the servo and video systems, and then do for the audio system.

Note: If necessary the VH microscope, consult your JVC dealer.

SECTION 3

ELECTRICAL ADJUSTMENTS

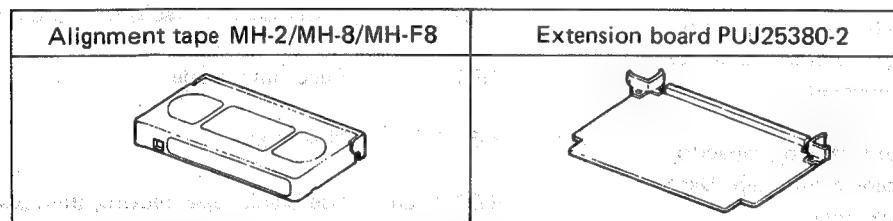
3.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

3.1.1 Required test equipment and jig

1. Digital voltmeter: HEWLETT-PACKARD Model 3476A/B or equivalent
2. Oscilloscope: Wide-band, Dual-trace
3. Signal generator: Color bar, Stairstep
4. Frequency counter: HEWLETT-PACKARD Model 5381A or equivalent
5. Regulated DC power supply
6. Audio generator: Wide-band
7. Alignment tape: JVC MH-2, MH-8, MH-F8
8. Extension board: PUJ25380-2

NOTE: Be sure to first check for smooth and proper tape transport before using the alignment tape.



Note: Use the Extension board for adjusting the servo board. Note the board orientation must be changed when adjusting the reel servo. See instructions printed on the extension board.

3.1.2 JVC alignment tape contents

1. MH-2 contents

Segment	Playback Time	Video Signal	Audio Signal	Applications
1	10 minutes	Stairstep	6 kHz	<ul style="list-style-type: none"> • Interchangeability checks and adjustments • Servo circuit checks and adjustments • Audio head azimuth adjustments
2	5 minutes	(none)	3 kHz	<ul style="list-style-type: none"> • Tape speed checks • Wow and flutter checks
3	10 minutes	Color bar	1 kHz (0 dB)	<ul style="list-style-type: none"> • Video signal playback circuit checks and adjustments • Audio signal playback circuit checks and adjustments
4	3 minutes	RF sweep	(none)	<ul style="list-style-type: none"> • Video head resonance adjustments, Q adjustments Marker: 2 MHz, 4 MHz, 5 MHz

2. MH-8 contents

Table 3-1

Segment	Playback Time	Video Signal	Audio Signal	Applications
1	2 minutes	Color sweep	400 Hz (-20 dB)	<ul style="list-style-type: none"> • Video frequency response playback circuit checks and adjustments
2	2 minutes		100 Hz (-20 dB)	<ul style="list-style-type: none"> • Audio frequency response playback circuit checks and adjustments
3	2 minutes		10 kHz (-20 dB)	
4	4 minutes		(none)	

3. MH-F8 (FM Audio) contents

Table 3-2

Segment	Playback Time	Video Signal	Audio Signal	Applications
1	5 minutes	—	Carrier only	<ul style="list-style-type: none"> • Interchangeability checks for video and audio
2	5 minutes	—	1 kHz (±50kHz DEV.)	<ul style="list-style-type: none"> • FM audio signal playback circuit checks and adjustments

Table 3-3

3.1.3 Check and Adjustment steps

The check and adjustment steps are provided in the following in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

Note: Do not use an alignment tape for the mechanism and tape running checks.

Before making an adjustment using an alignment tape, confirm tape transport by using ordinary tape.

No. Checks and adjustments are numbered in the recommended sequence in which they are to be performed.

Item Name assigned to the particular check and adjustment step

Check Point Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected.

Adjustment Parts Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (-) indicates check only.

Signal Input signal required to perform adjustment. Dash (-) indicates that special signal is not required.

Color bar Color bar signal as video input

Stairstep Stairstep signal as video input

1 kHz Supply a 1 kHz sinewave as audio input signal.

MH-2 Color bar Play color bar segment of JVC MH-2 alignment tape.

MH-2 Stairstep Play stairstep segment of JVC MH-2 alignment tape.

MH-2 3 kHz Play 3 kHz audio signal segment of JVC MH-2 alignment tape.

MH-2 1 kHz Play 1 kHz audio signal segment of JVC MH-2 alignment tape.

MH-2 RF Sweep Play RF sweep segment of JVC MH-2 alignment tape.

MH-8 Color sweep Play color sweep segment of JVC MH-8 alignment tape.

MH-8 400 Hz Play 400 Hz audio signal segment of JVC MH-8 alignment tape.

3.1.4 Waveforms

MH-8 100 Hz Play 100 Hz audio signal segment of JVC MH-8 alignment tape.

MH-8 10 kHz Play 10 kHz audio signal segment of JVC MH-8 alignment tape.

MH-F8 Carrier Play audio carrier segment of JVC MH-F8 alignment tape.

MH-F8 1 kHz Play 1 kHz (\pm 50 kHz DEV) audio signal segment of JVC MH-F8 alignment tape.

Mode Equipment operating mode at time of check or adjustment

STOP Power on and machine in Stop mode

REC Recording mode

P.B. Play mode

REC \rightarrow (another mode) Use blank tape, record, then play back in the mode specified.

AUDIO DUB Audio dubbing mode

E-E Input signal to output

FF Fast Forward mode

REW Rewind mode

PAUSE Pause mode

STILL Still mode playback

Loading Stop mode to playback mode

Unloading Playback mode to Stop mode

SEARCH FWD Search forward mode (varies the playback speed continuously from still to 5 times normal in the forward direction).

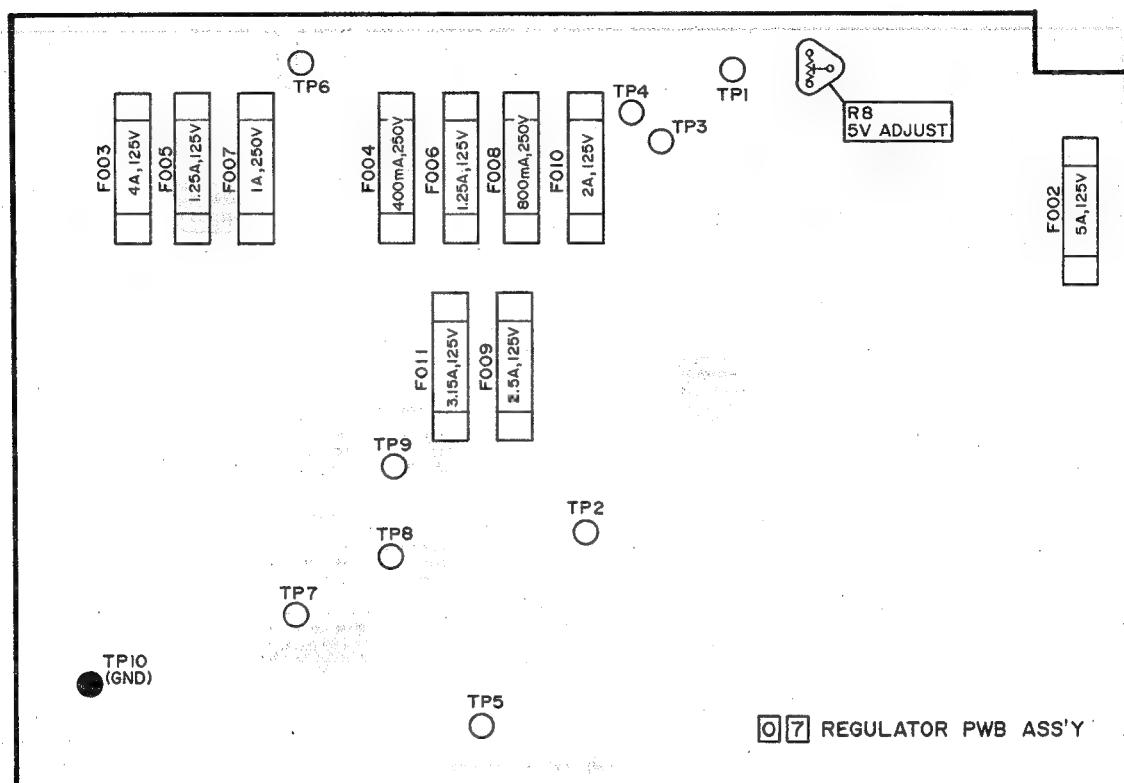
SEARCH REV Search reverse mode (varies the playback speed continuously from still to 5 times normal in the reverse direction.)

Description and Waveform This column provides an explanation of the step, notes, adjustment values and waveform diagrams.

3.2 POWER SUPPLY CIRCUIT

– Regulator PWB –

Part locations viewed from parts side.

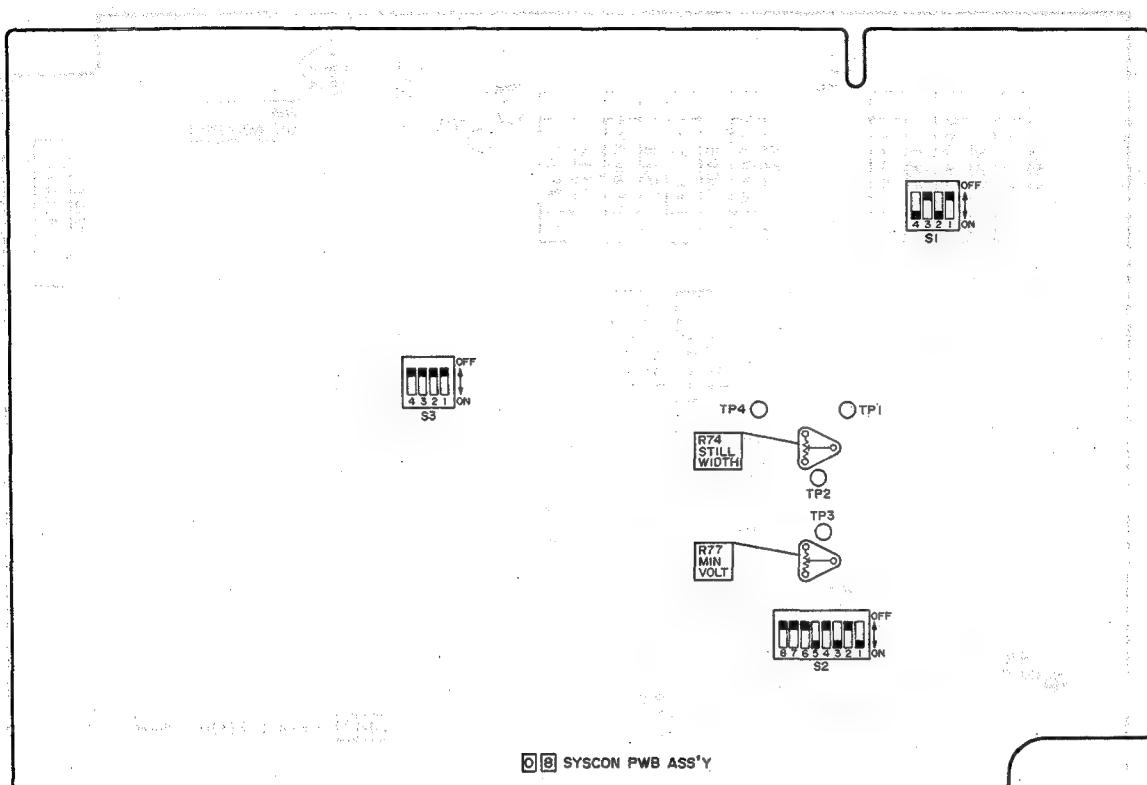


No.	Item	Check Point	Adjustment Points	Signal	Mode	Description and Waveform
1	18.5 V DC Output	TP3 (REGULATOR)	—	—	P.B.	<p>1. Connect the digital voltmeter to TP3 of the regulator board.</p> <p>2. Confirm that the voltage is 18.5 ± 1.5 V DC.</p>
2	12 V DC Output	TP6 (REGULATOR)	—	—	P.B.	<p>1. Connect the digital voltmeter to TP6 of the regulator board.</p> <p>2. Confirm that the voltage is 12.0 ± 0.2 V DC.</p>
3	5 V DC Output	TP1 (REGULATOR)	R8 (REG)	—	P.B.	<p>1. Connect the digital voltmeter to TP1 of the regulator board.</p> <p>2. Adjust R8 (REG) so that voltage at TP1 becomes 5.0 V DC.</p>

3.3 SYSTEM CONTROL (SYSCON) CIRCUIT

— System control PWB —

Part locations viewed from parts side.



□ S SYSCON PWB ASS'Y

No.	Item	Check Point	Adjustment Points	Signal	Mode	Description and Waveform
1	Minimum Voltage	TP4 SYSCON	R77 (MIN. VOLT) SYSCON	—	STOP	<ol style="list-style-type: none"> Connect the digital voltmeter to TP4 of the Syscon board. Set the search dial to the center click position. Adjust R77 of the Syscon board to obtain 2.7 V DC.
2	Still width	TP-1, 2, 4 Syscon	R74 (STILL WIDTH),	—	STOP	<p>● Perform the following steps only after completing item 4, Minimum voltage setting.</p> <p>VR1: Clockwise → FWD Counter-clockwise → REV. SEARCH DIAL: Center Click → High → Low → Variable by R74</p> <p>TP-4: 2.9 ± 0.05 V TP-1 (REV CMD): LOW → High → LOW TP-2 (FWD CMD): High → LOW</p> <ol style="list-style-type: none"> Connect oscilloscope to TP-2; Confirm high potential (approx. 5 V DC). If low (about 0 V DC), adjust R74 for high. Connect a digital voltmeter to TP-4 and the oscilloscope to TP-1. Slowly turn the search dial clockwise and check the voltage at TP-1 and TP-4. Adjust R74 so that the TP-1 voltage drops from high to low when the TP-4 voltage exceeds 2.9 ± 0.05 V. Change the oscilloscope connection from TP-1 to TP-2. Turn the search dial slowly counter-clockwise past the center click position. Confirm that the TP-2 voltage drops from high to low when the TP-4 voltage exceeds 2.9 ± 0.05 V.

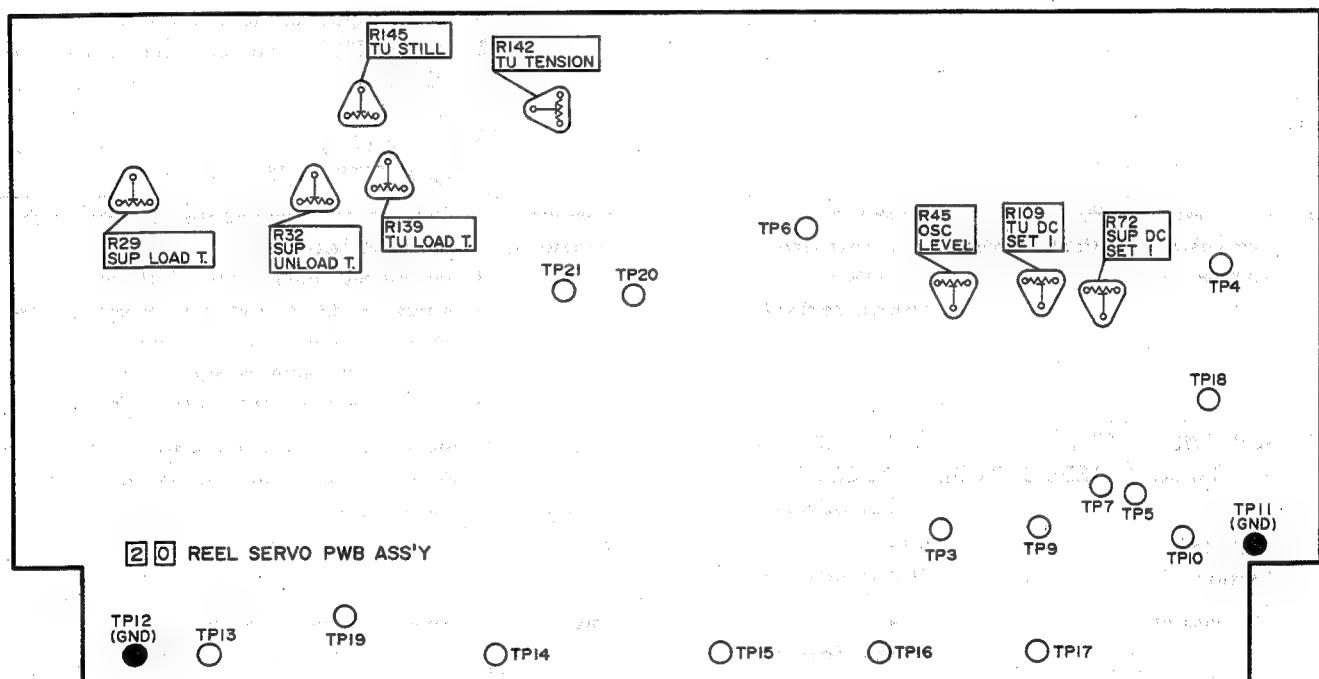
3.4 SEARCH CIRCUIT

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description and Waveform
1	Search VR setting	R1 center position Search PWB or Pin 2 of CN28 on Syscon PWB	R2 (SEARCH VR) SEARCH	-	SEARCH	1. Set R1 of the search board to the center click position. 2. Connect digital voltmeter to pin 2 of CN28 on syscon PWB. 3. Adjust R2 of the search board to obtain 6.0 ± 0.05 V DC.

3.5 REEL SERVO CIRCUIT

— Reel servo PWB —

Part locations viewed from parts side.



20 REEL SERVO PWB ASS'Y

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure
1	Osc. Level	TP3 [REEL SERVO]	R45 (OSC LEVEL) [REEL SERVO]	-	STOP	1. Connect the oscilloscope to TP3 of the reel servo board. 2. Confirm that the oscillation frequency is 3–3.8 kHz. 3. Adjust R45 of the reel servo board to obtain the level of 3.0 Vp-p.
2	SUP. DC Set 2	TP5, TP12 (GND) [REEL SERVO]	R72 (SUP. DC SET 2) [REEL SERVO]	-	STOP	1. Connect the digital voltmeter to TP5 of the reel servo board. 2. Adjust R72 of the reel servo board to obtain 6.0 V DC.
3	TU DC Set	TP7, TP12 (GND) [REEL SERVO]	R109 (TU DC SET) [REEL SERVO]	-	STOP	1. Connect the digital voltmeter to TP7 of the reel servo board. 2. Adjust R109 of the reel servo board to obtain 6.0 V DC.

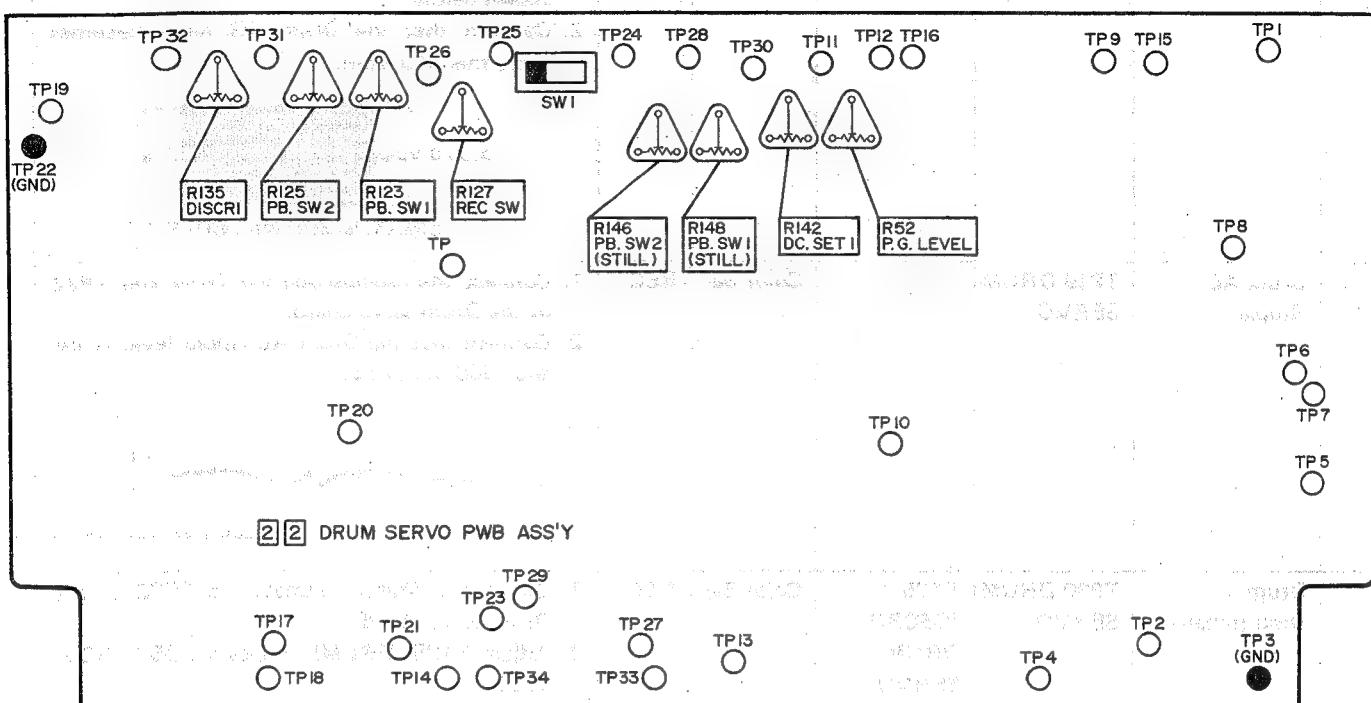
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure
4	SUP. DET Level	TP1 [REEL SERVO]	R1 (SUP. DET LEVEL) [REEL SERVO]	—	STOP Play	<ol style="list-style-type: none"> Connect the oscilloscope to TP1 of the reel servo board. Adjust R1 of the reel servo board to obtain the level of 0.7 Vp-p. Set for the Play mode with a tape loaded. Push the tension pole by fingers fully to left side (to minimize oscillation input). Confirm that input level is 0.05–0.1 Vp-p at TP1 of the reel servo board.
5	SUP. LOAD/UNLOAD Voltage	TP10 [REEL SERVO]	R29 (SP LOAD T) [REEL SERVO]	—	Play ↓ STILL Loading/ Unloading	<ol style="list-style-type: none"> Connect the oscilloscope to TP10 of the reel servo board. Ground the probe at the Q10 heat sink. Set for the loading mode at the beginning of a T120 tape. At this time, confirm that the voltage at TP10 is 0 mV. If not, adjust R29 to obtain 0 mV. In the STILL mode, pull the tension arm rightward (in the direction of the drum) to the limit. In Unloading operation, confirm that voltage at TP10 is 135 ± 10 mV.
6	TU LOAD/UNLOAD Voltage	TP9 [REEL SERVO]	R139 (TU LOAD/UNLOAD T) [REEL SERVO]	—	Loading/ Unloading	<ol style="list-style-type: none"> Connect the oscilloscope to TP9 of the reel servo board. Set the beginning of the T120 tape. Adjust R139 so that the voltage at TP9 becomes 40 mV DC in Loading. Confirm the same voltage in Unloading. If not, adjust R139 to obtain 40 mV.
7	SUP. FWD Min. Tension	TP10 [REEL SERVO]	R170 (SUP. DC SET 3) [REEL SERVO]	—	Play ↓ STILL	<ol style="list-style-type: none"> Move the tension arm inward. At this time, obtain 10 mV at TP10 by adjusting R170.
8	SUP. Back Tension	—	R167 [REEL SERVO]	—	Play	1. Refer to section 2.6.15.
9	TU Tension	—	R142 [REEL SERVO]	—	Play	1. Refer to section 2.6.15.
10	TU STILL Tension	TP9 [REEL SERVO]	R145 (TU STILL TENS.) [REEL SERVO]	—	Play ↓ STILL	<ol style="list-style-type: none"> Connect the oscilloscope to TP9 of the reel servo board. Play back the beginning portion of the T120 tape and set the unit for the STILL mode. Adjust R145 to obtain 75 mV DC at that time.
11	SEARCH REV Back Tension	—	R183 (TU SEARCH REV)	—	SEARCH REV (Slow mode)	1. Refer to section 2.6.15.
12	TU. Motor Voltage in FF mode	TP17 [REEL SERVO]	—	—	FF	<ol style="list-style-type: none"> With the oscilloscope connected to TP17 of the reel servo board, set the unit for the FF mode at the beginning of T120 tape. Confirm that the voltage and waveform are standard after 3 minutes of the mode shift.

Note: To avoid measuring error resulting from the ground potential, connect the GND probe of the oscilloscope to the heat sink of Q10 (transistor) of the reel servo board.

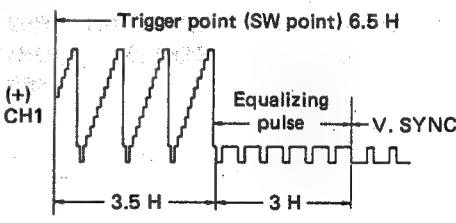
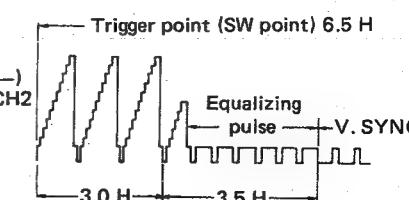
3.6 DRUM SERVO CIRCUIT

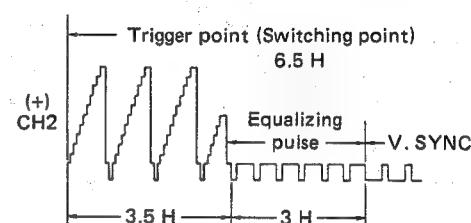
— Drum servo PWB —

Part locations viewed from pattern side.



No.	Item	Check Point	Adjustment Points	Signal	Mode	Description and Waveform
1	Drum Pulse Level	TP25 DRUM SERVO	R52 DRUM SERVO	Color Bar	REC	<p>1. Connect the oscilloscope to TP25 of the Drum servo board.</p> <p>2. Adjust R52 (DRUM) so that voltage at TP25 becomes $a = b = 4.0$ V DC. The waveform is as shown below.</p>

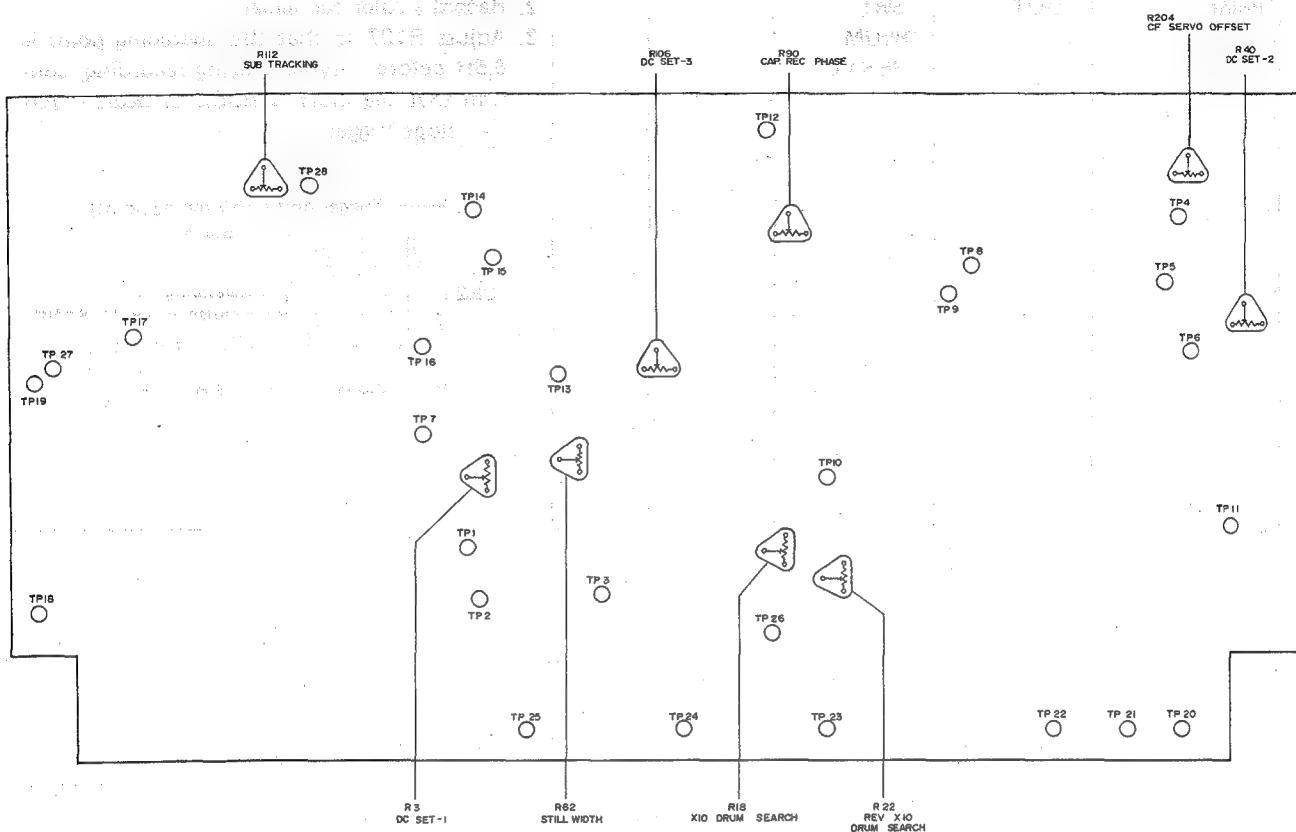
No.	Item	Check Point	Adjustment Points	Signal	Mode	Description and Waveform
2	Durm FG Level	TP32 DRUM SERVO	—	Color Bar	REC	<p>1. Connect the oscilloscope to TP32 of the Drum servo board. Confirm the waveform as shown below.</p> <p>2. Confirm that the Drum FG level becomes more than 3.0 Vp-p.</p>  <p>$b \geq 3.0 \text{ Vp-p}$</p> <p>$b(\text{MAX. level})/a(\text{Min. level}) < 1.1$</p>
3	Drum AC Ripple	TP19 DRUM SERVO	—	Color Bar	REC	<p>1. Connect the oscilloscope to TP19 and TP22 of the Drum servo board.</p> <p>2. Confirm that the Drum AC ripple level is less than 300 mVp-p.</p>  <p>Less than 300 mVp-p</p>
4	Drum Discriminator	TP30 DRUM SERVO	R135 (DSCR1) DRUM SERVO	Color Bar	REC	<p>1. Connect a digital voltmeter to TP30 of the Drum servo board.</p> <p>2. Adjust R135 (DRUM) to obtain 5.35 V DC at TP30.</p>
5	P.B Switching Point	VIDEO OUT or Y PWB TP19	R123 (NOR) P.B SW-2 DRUM SERVO	MH-2 (Stairstep)	P.B	<p>1. Connect the oscilloscope to VIDEO OUT.</p> <p>2. Play the stairstep segment of MH-1 and set the tracking VR for maximum level meter indication.</p> <p>3. Use the trigger signal of D-FF (TP24 with + slope).</p> <p>4. Adjust R123 (DRUM) so that the switching point is 6.5 H before V-sync.</p>  <p>Trigger point (SW point) 6.5 H</p> <p>(+) CH1</p> <p>Equalizing pulse</p> <p>V. SYNC</p> <p>3.5 H 3 H</p>
			R125 (NOR) P.B SW-1 DRUM SERVO	MH-2 (Stairstep)	P.B	<p>5. Change the trigger signal slope to —.</p> <p>6. Adjust R125 (DRUM) so that the switching point is 6.5 H before V-sync.</p>  <p>Trigger point (SW point) 6.5 H</p> <p>(-) CH2</p> <p>Equalizing pulse</p> <p>V. SYNC</p> <p>3.0 H 3.5 H</p>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description and Waveform
6	REC Switching Point	VIDEO OUT	R127 (REC SW) DRUM SERVO	Color Bar	REC	<p>1. Connect the oscilloscope to VIDEO OUT. 2. Record a color bar signal. 3. Adjust R127 so that the switching point is 6.5H before V-sync. During recording, confirm that the 6.5H is stable at both + and - slope trigger.</p> 

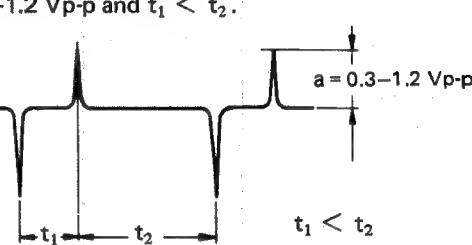
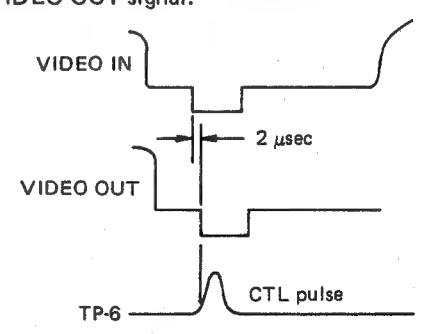
3.7 CAPSTAN SERVO CIRCUIT

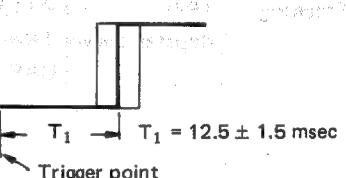
– Capstan Servo PWB –

Part locations viewed from parts side.



No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description and Waveform
1	CTL Amp. DC SET-2	TP-5 Capstan Servo	R40 (DC SET-2) CAP.SERVO	—	STOP	1. Connect a digital voltmeter to TP-5 of the Capstan servo board. 2. Adjust R40 to obtain a DC voltage of 6.5 V.
2	FG (Frequency Generator) Amp. DC SET-1	TP-1 Capstan Servo	R3 (DC SET-1) CAP.SERVO	—	STOP	1. Connect a digital voltmeter to TP-1 of the Capstan servo board. 2. Adjust R3 to obtain a DC voltage of 7.0 V.
3	Still Width	TP-7 Capstan Servo	R62 (STILL WIDTH) CAP.SERVO	—	STOP	1. Connect a digital voltmeter to TP-7 of the Capstan servo board. 2. Adjust R62 to obtain a DC voltage of 3.00 ± 0.08 V.
4	Capstan Discriminator (DC SET-3)	TP-13 Capstan Servo	R106 (DC SET-3) CAP.SERVO	Color Bar	REC	1. Connect a digital voltmeter to TP-13 of the Capstan servo board. 2. Adjust R106 to obtain a DC voltage of 5.10 V.
5	Capstan FG (Frequency Generator)	TP-1 Capstan Servo	—	Color Bar	REC	1. Connect oscilloscope to TP-1 of the Capstan servo board. 2. Confirm that the capstan FG level fluctuation becomes less than 1.2 between a and b.

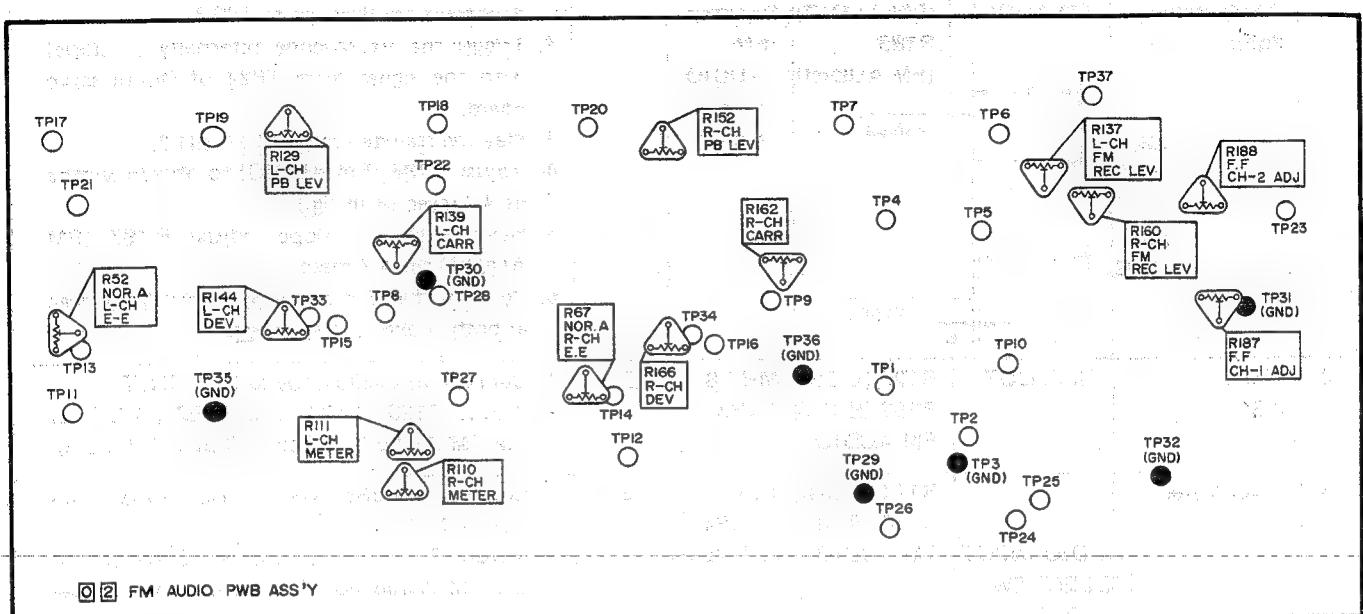
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description and Waveform	
6	P.B. CTL Level	TP-6 Capstan Servo	MH-1 Stairstep	P.B.	1. Connect oscilloscope to TP-6 of the Capstan servo board. 2. Set the tracking VR at the center click position. 3. Confirm that the P.B. CTL level becomes $0.3 - 1.2 \text{ Vp-p}$ and $t_1 < t_2$.		
7	Sub. Tracking Adj.	TP-6 Capstan Servo	R112 (SUB TRACKING) CAP.SERVO	Color Bar	REC ↓ P.B.	1. Supply a color bar signal to VIDEO IN. 2. Connect the oscilloscope to VIDEO IN and VIDEO OUT. At the dual trace mode, synchronize the signals at the decay point of V. sync waveform of the VIDEO INPUT signal. 3. Set the tracking control to the center click position. 4. Adjust R112 so that VIDEO OUT playback signal is delayed 2 μsec from the VIDEO IN signal. 5. Change the oscilloscope connection from VIDEO IN to TP6 of the Capstan servo board. 6. Trigger the oscilloscope externally with the signal from TP17 of the Drum servo board. use (-) slope. 7. Confirm that the CTL pulse at TP-6 of the Capstan servo board is near the V. sync of the VIDEO OUT signal.	 <p>Note: Ext trigger of TV mode. Delay mode at 2 $\mu\text{sec}/\text{div}$.</p>
8	Drum Search	TP32 Drum Servo	R18 Capstan Servo (x10 DRUM SERVO)	-	FWD ↓ STILL ↓ SER. REV. (1/15)	1. Turn R22 fully counterclockwise as viewed from parts mounted side of the circuit board. 2. Connect a frequency counter to TP-32 of the Drum servo board. 3. During forward, set for the Still mode. 4. Adjust R18 to obtain a frequency of 1494 Hz $\pm 1 \text{ Hz}$. 5. Set Playback mode and SER. REV. control to Slowest speed. 6. Adjust R22 to obtain a frequency of 1492 Hz $\pm 1 \text{ Hz}$.	

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description and Waveform
9	Capstan REC Phase	TP-12 Capstan	R90 (Capstan Servo (CAP. REC PHASE))	Color Bar	REC ↓ PAUSE ↓ REC	<p>1. Connect oscilloscope to TP-12 of the Capstan servo board.</p> <p>2. Trigger the oscilloscope externally (- slope) with signal from TP-24 of the Drum servo board.</p> <p>3. During recording, press the PAUSE button and set for the Pause mode.</p> <p>4. Press the PLAY button. After playing back the preroll segment, when the REC mode is entered, check that TP12 waveform fluctuation is within ± 1.5 ms.</p> <p>5. If outside this range, adjust R90 (CAP REC PHASE). Then repeat steps 3 to 5.</p>  <p>Note: Before this adjustment, the SW POINT, REC SW. POINT and SUB TRACKING.</p>

3.8 FM AUDIO CIRCUIT

- FM Audio PWB -

Part locations viewed from parts side.



Note: Perform the following steps only after completing item 3.10.12 "Video REC FM Level", 3.10.13 "REC Color Channel Balance & Color Level".

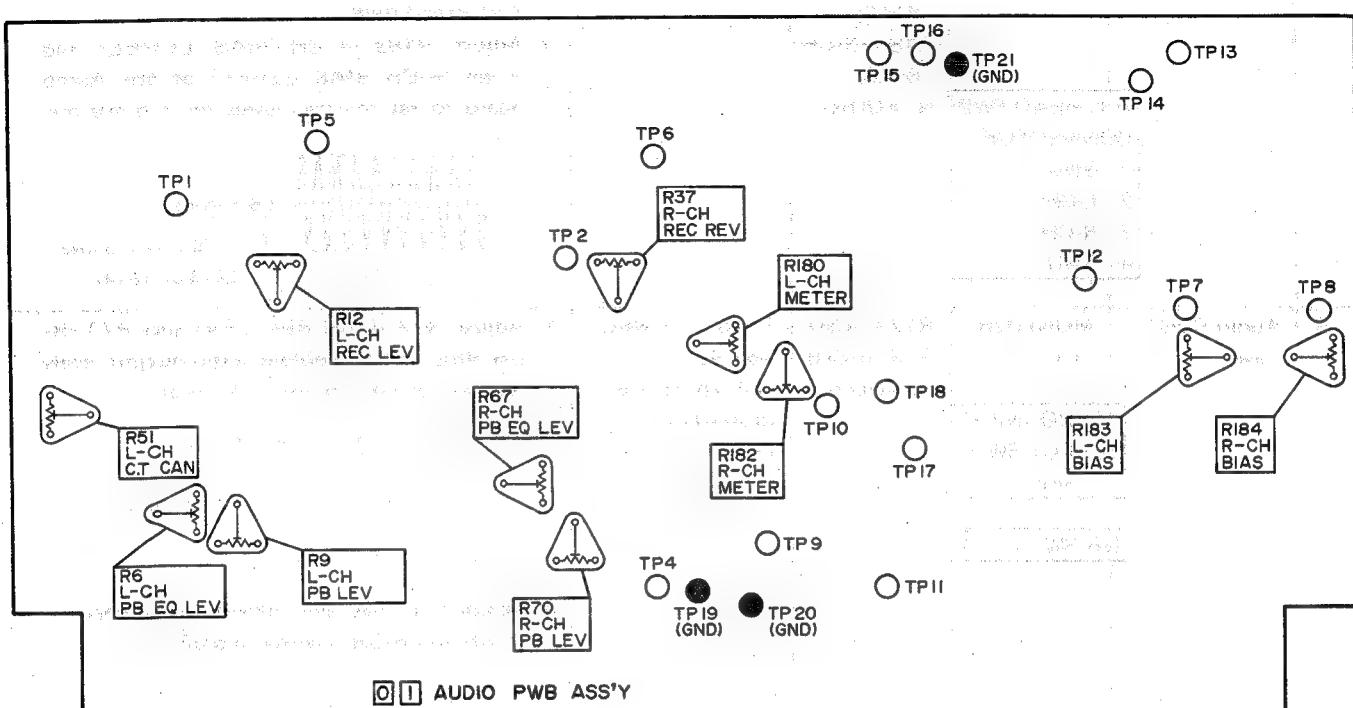
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description and Waveform
1	FM A. Carrier Frequency	TP-15 (1.4 MHz) TP-16 (1.8 MHz) O 2 FM Audio	R139 (L-CH FM CAR) R162 (R-CH FM CAR) O 2 FM Audio	-	REC	<ol style="list-style-type: none"> Connect a frequency counter to TP-15 (1.4 MHz) and TP-16 (1.8 MHz) of the FM Audio board. Adjust R139 (L-CH FM CAR) of the FM Audio board to obtain $1.4\text{ MHz} \pm 1\text{ kHz}$. Adjust R162 (R-CH FM CAR) of the FM Audio board to obtain $1.8\text{ MHz} \pm 1\text{ kHz}$.
2	FM A. REC Level	TP-1 (L-CH REC LEVEL) TP-3 (GND) O 2 FM Audio	R137 (L-CH REC LEVEL) R160 (R-CH REC LEVEL) O 2 FM Audio	-	REC	<ol style="list-style-type: none"> Set the oscilloscope vertical gain to 20 mV/DIV and horizontal gain to 0.5 $\mu\text{sec}/\text{DIV}$. Turn R137 (L-CH REC LEVEL) and R160 (R-CH REC LEVEL) of the FM Audio board fully clockwise (○) as viewed from parts side of board. Refer to figure and gradually turn R137 (L-CH REC LEVEL) (○) of the FM Audio board clockwise to set the 1.4 MHz component to 34 mVp-p. Refer to figure and gradually turn R160 (R-CH REC LEVEL) (○) of the FM Audio board clockwise to set the mixed waveforms (1.4 MHz and 1.8 MHz) to 110 mVp-p.

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description and Waveform
3	FMA. P.B Switching Point	TP23 FM AUDIO	R187 (FM AUDIO) R188 (FM AUDIO)	MH-2 Stairstep (FM AUDIO is no signal)	P.B	<p>1. Connect both probes (CH1 and CH2) of a dual-trace oscilloscope to TP23.</p> <p>2. Trigger the oscilloscope externally (+ slope) with the signal from TP24 of Drum servo board.</p> <p>3. Play the stairstep segment of MH-2.</p> <p>4. Adjust R188 (FM AUDIO) to obtain width of 4.7 msec (A in fig.).</p> <p>5. Next, with — slope, adjust R187 (FM AUDIO) for 4.7 msec.</p> <p>6. Confirm that B is obtained within 0.05 msec at both + and — slope trigger.</p>
4	FMA. P.B	Hi-Fi OUT	R129 (L-CH) R152 (R-CH) FM AUDIO	MH-F8 1 kHz	P.B	<p>1. Connect an oscilloscope to Hi-Fi OUT.</p> <p>2. Adjust R129 (L-CH) and R152 (R-CH) of the FM Audio board for -6 dBs (1.1 Vp-p).</p>
5	Level Meter	AUDIO INPUT SELECT SW : SEP METER SELECT SW : Hi-Fi MONITOR SELECT SW : HiFi	R111 (L-CH) R110 (R-CH) FM AUDIO	1 kHz -6 dBs (1.1 Vp-p)	E-E	<p>1. Confirm -6 dBs audio output signal from Audio OUT.</p> <p>2. Adjust R111 (L-CH) and R110 (R-CH) of the FM Audio board for 0 dB on the level meter.</p>
6	REC/P.B Level	Hi-Fi OUT AUDIO INPUT SELECT SW : SEP Hi-Fi REC SW : ON	R144 (L-CH) R166 (R-CH) FM AUDIO	1 kHz -6 dBs (1.1 Vp-p)	E-E REC ↓ P.B	<p>1. Perform FMA P.B. Level adjustment (item 3.8.4).</p> <p>2. During recording, turn R144 (L-CH DEV) of the FM Audio board to desired position.</p> <p>3. Then play back and confirm that the output level is -6 dBs (1.1 Vp-p).</p> <p>4. If output level is insufficient, readjust the steps 2 and 3.</p> <p>5. In the same manner, adjust R166 (R-CH DEV) of the FM Audio for -6 dBs (1.1 Vp-p).</p>
7	REC/P.B Frequency Response	Hi-Fi OUT (L/R)		20 Hz, 50 Hz, 1 kHz, 15 kHz, 20 kHz, -16 dBs (0.34 Vp-p)	REC ↓ P.B	<p>1. Record, then play back.</p> <p>2. Set the 1 kHz level for 0 dB reference signal and confirm the frequency response as shown in figure.</p>
8	Distortion	Hi-Fi (L/R)		1 kHz 8 dBs (5.5 Vp-p) Color Bar	REC ↓ P.B	<p>1. Confirm that the distortion is less than 1.5%.</p>

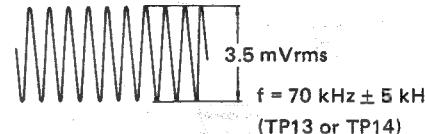
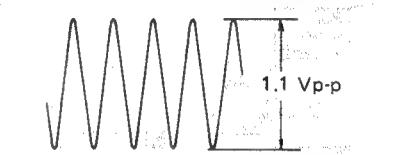
3.9 AUDIO CIRCUIT

— Audio PWB —

Part locations viewed from parts side.



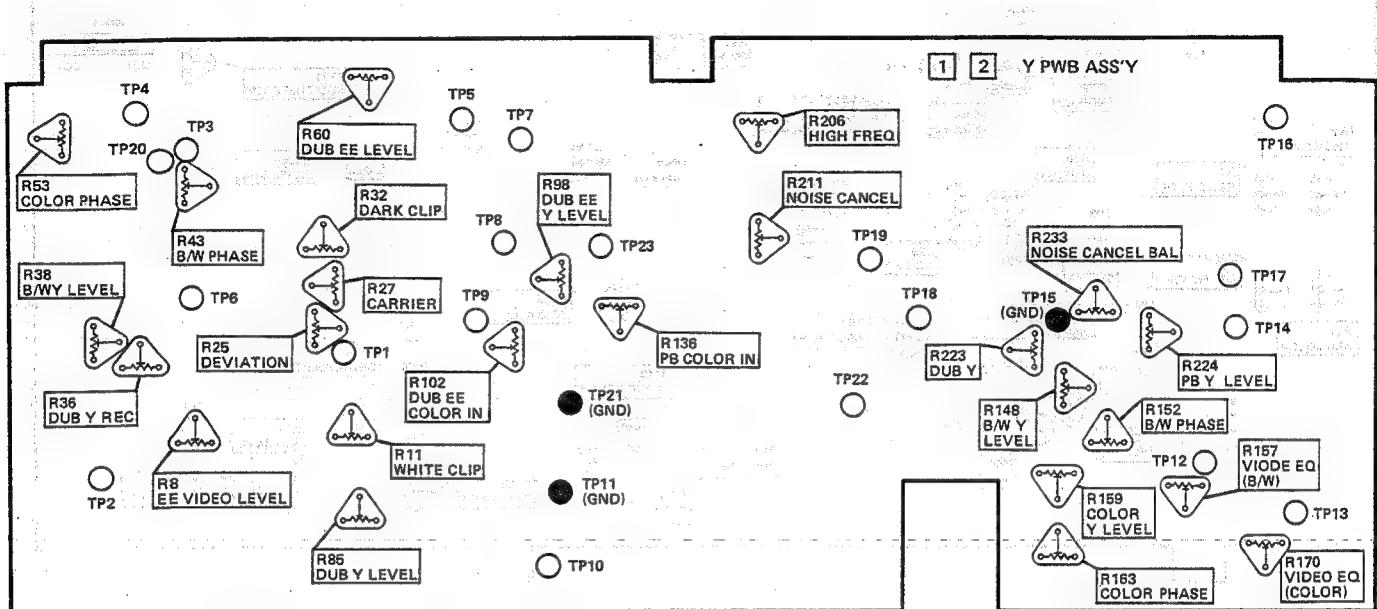
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description and Waveform								
1	Level Meter	On the Meter AUDIO INPUT SELECT SW : SEP	R180 (L-CH) R182 (R-CH) N. AUDIO	1 kHz -6 dBs (1.1 Vp-p)	E-E	<p>1. Adjust LEVEL VR for -6 dBs audio output signal from Audio out.</p> <p>2. Adjust R401 (L-CH) and R402 (R-CH) of the Audio board for 0 dB on the level meter.</p>								
2	P.B Level	MONITOR OUT (L/R) N. AUDIO NR SW: OFF	R9 (L-CH) R70 (R-CH) N. AUDIO	MH-1 1 kHz, 0 dB 0.88 Vp-p	P.B	<p>1. At 1 kHz 0 dB playback, adjust R9 (L-CH P.B. LEVEL) and R70 (R-CH P.B. LEVEL) to obtain audio output levels with no load -8 dBs (0.88 Vp-p).</p>								
3	P.B Frequency Response	MONITOR OUT (L/R)	R6 (L-CH P.B EQ) R67 (R-CH) N. AUDIO	MH-8 400 Hz, 100 Hz, 8 kHz, -20 dB	P.B	<p>1. Adjust R6 (L-CH) of the Audio board to obtain the frequency response shown in the Table (100 Hz is check only).</p> <p>2. Set the 400 Hz signal for 0 dB reference level.</p> <table border="1"> <thead> <tr> <th>Frequency</th><th>Level (dB)</th></tr> </thead> <tbody> <tr> <td>400 Hz</td><td>0 dB</td></tr> <tr> <td>100 Hz</td><td>-0.5 ± 2.0</td></tr> <tr> <td>8 kHz</td><td>0 dB</td></tr> </tbody> </table> <p>3. In the same manner, adjust R67 (R-CH) of the Audio board.</p>	Frequency	Level (dB)	400 Hz	0 dB	100 Hz	-0.5 ± 2.0	8 kHz	0 dB
Frequency	Level (dB)													
400 Hz	0 dB													
100 Hz	-0.5 ± 2.0													
8 kHz	0 dB													

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Description and Waveform								
4	Bias Level	N. AUDIO A/C HEAD PWB CONNECTOR 1 GND 2 L-CH 3 R-CH 4 GND	R183 (L-CH BIAS) R184 (R-CH BIAS) N. AUDIO	No signal	REC	<p>1. Connect an Audio tester to connector of the A/C HEAD PWB.</p> <p>2. Adjust R183 (L-CH BIAS LEVEL) and R184 (R-CH BIAS LEVEL) of the Audio board to set the bias levels for 3.5 mVrms.</p> 								
5	Audio REC Level	MONITOR OUT AUDIO INPUT SELECT SW : SEP NR SW : OFF	R12 (L-CH) R73 (R-CH) N. AUDIO	1 kHz -6 dBs (1.1 Vp-p) to AUDIO IN	REC ↓ P.B	<p>1. Adjust R12 (L-CH REC LEV) and R73 (R-CH REC LEV) to obtain audio output levels with no load of -6 dBs (1.1 Vp-p).</p>  <p>Note: Confirm that level difference between L-CH and R-CH is within 0.5 dB.</p>								
6	REC/P.B Frequency Response	MONITOR OUT (L/R) AUDIO INPUT SELECT SW : SEP NR SW : ON	R183 (L-CH) R184 (R-CH) N. AUDIO	40 Hz, 100 Hz, 12 kHz -26 dBs (0.11 Vp-p)	REC ↓ P.B	<p>1. Supply audio input signal of 100 Hz, 20 Hz and 12 kHz at -26 dBs to LINE IN.</p> <p>2. Confirm that the frequency response is as shown in the following Table.</p> <p>3. Set the 1 kHz signal for 3 dB reference level.</p> <p>4. If 12 kHz is insufficient, readjust the bias level (Section 3.9.4).</p> <ul style="list-style-type: none"> If 12 kHz level is higher than the spec., change the bias level to higher side (Max. 4.0 mVrms). If 12 kHz level is lower than the spec., change the bias level to lower side (Min. 3.0 mVrms). <p>Note: Confirm that level difference between CH-1 and CH-2 is within 3 dB at 12 kHz. Disengage the bias adjust connector when checking the frequency response.</p> <table border="1"> <thead> <tr> <th>Frequency</th> <th>Level (dB)</th> </tr> </thead> <tbody> <tr> <td>40 Hz</td> <td>-2.0 ± 3 dB</td> </tr> <tr> <td>100 Hz</td> <td>0 ± 2.5 dB</td> </tr> <tr> <td>12 kHz</td> <td>0 ± 2.5 dB</td> </tr> </tbody> </table>	Frequency	Level (dB)	40 Hz	-2.0 ± 3 dB	100 Hz	0 ± 2.5 dB	12 kHz	0 ± 2.5 dB
Frequency	Level (dB)													
40 Hz	-2.0 ± 3 dB													
100 Hz	0 ± 2.5 dB													
12 kHz	0 ± 2.5 dB													
7	Crosstalk Cancel	MONITOR OUT MONITOR SEL SW : NORMAL	R51 N. AUDIO	3 kHz -20 dBs	AUDIO DUB	<p>1. Adjust R51 (L-CH) of the Audio board for minimum L-CH level with no load (MONITOR OUT).</p>								

3.10 VIDEO CIRCUIT

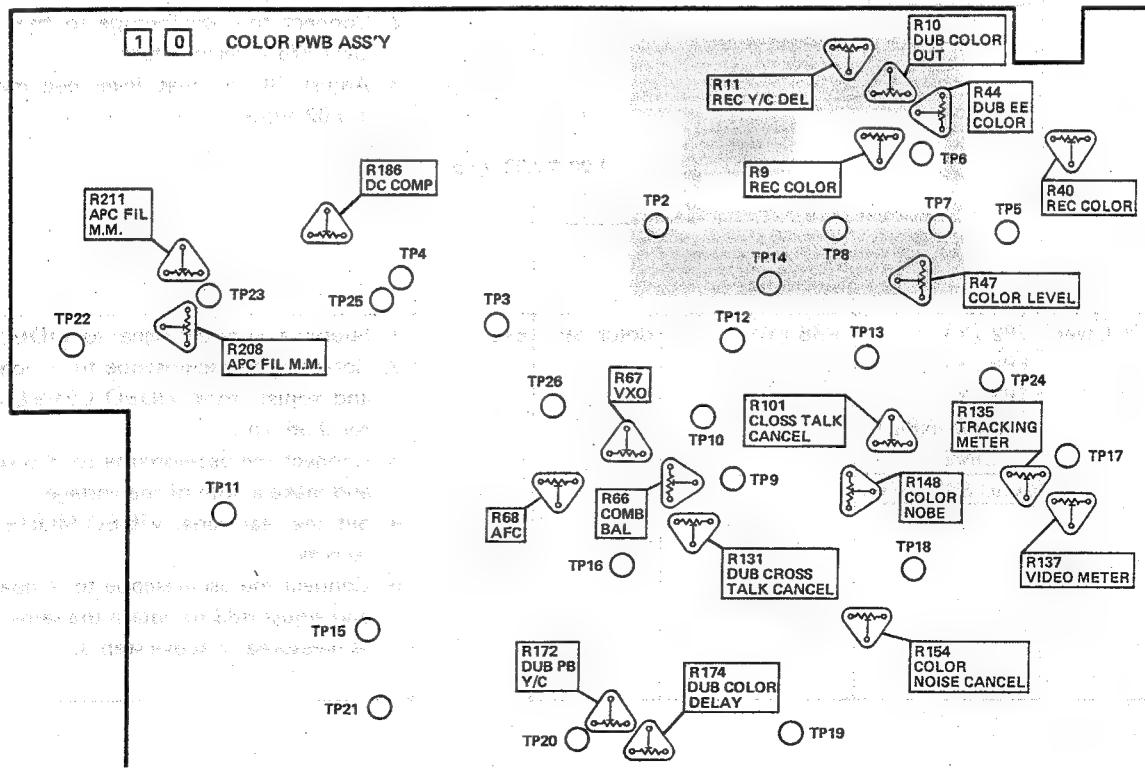
— Y PWB —

Part locations viewed from parts side.



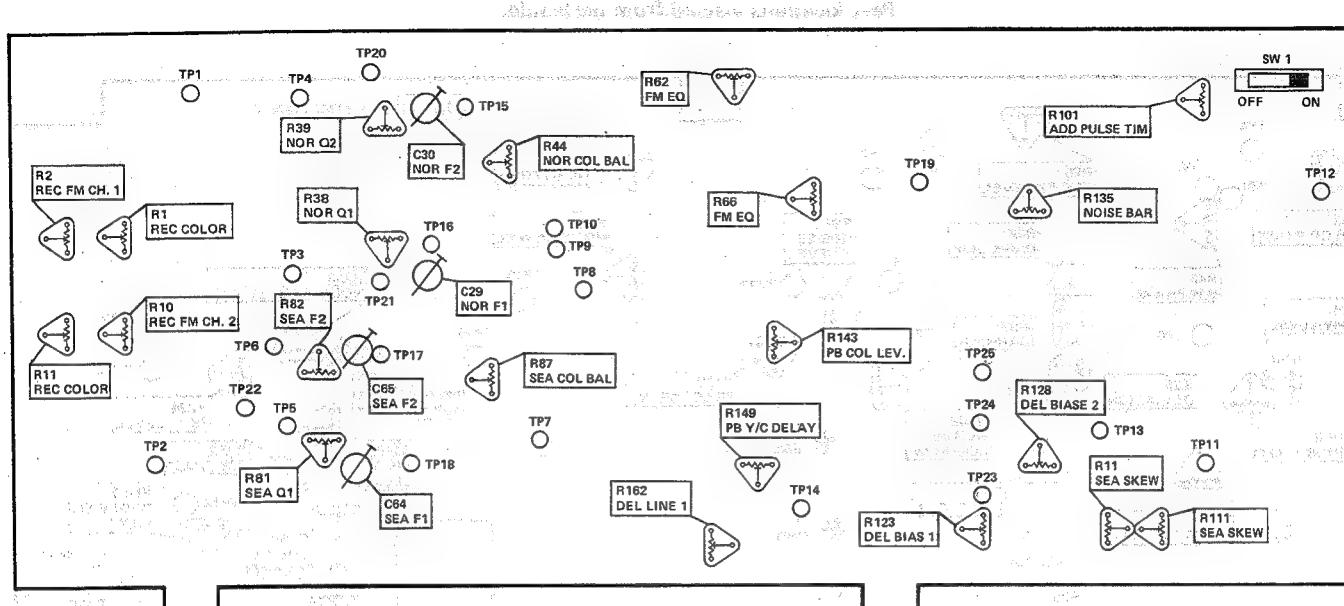
— Color PWB —

Part locations viewed from parts side.



- PRE/REC PWB -

Part locations viewed from parts side

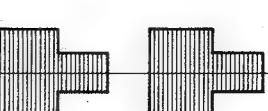


No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure
1	AGC	VIDEO OUT AGC SW : ON	R8 [Y]	Color bar	E-E	<ol style="list-style-type: none"> Supply the color bar signal to the VIDEO IN terminal. Connect the oscilloscope to the VIDEO OUT ($75\ \Omega$ terminated). Adjust R8 so that level becomes 1.00 ± 0.02 Vp-p.
2	B/W Y Level	TP2 [Y] TP4 [Y] TP3 [Y] VIDEO INPUT: LINE AGC SW: OFF	R38 [Y]	Color bar	E-E	<ol style="list-style-type: none"> Supply a color bar signal to VIDEO IN. Connect the oscilloscope to Y board TP2 and adjust front VIDEO LEVEL control for 0.35 Vp-p. Connect the oscilloscope to Y board TP4 and make a note of the voltage. Set the rear panel VIDEO MODE switch to B/W. Connect the oscilloscope to Y board TP3 and adjust R38 to obtain the same voltage as measured in above step 3.

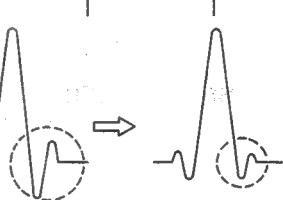
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure
3	Carrier & Deviation	IC2 pin 11 [Y] IC2 pin 16 [Y]	R27 [Y] R25 [Y]	Color bar Color bar	E-E REC	<p>1. Supply a color bar signal to VIDEO IN.</p> <p>2. Use an oscilloscope to measure the DC voltage of the sync tip at Y board IC2 pin 16. Make a note of this as voltage "A".</p> <p>3. Then without a connection to VIDEO IN, use an external DC power supply to apply voltage "A" to pin 16 of IC2. Connect a frequency counter to pin 11 of IC2.</p> <p>4. Adjust Y board R27 to obtain 3.8 ± 0.1 MHz.</p> <p>5. Carefully raise the DC power supply voltage to where the frequency reaches 4.8 ± 0.1 MHz. Make a note of the voltage at this time as voltage "B".</p> <p>6. Disconnect the external DC power supply from IC2 pin 16 and again supply the color bar signal to VIDEO IN.</p> <p>7. Set for the Recording mode and connect the oscilloscope to IC2 pin 16. Adjust R25 to where the white peak equals voltage "B".</p>
4	White and Dark Clip	TP1 [Y]	R11 (WHITE CLIP) R32 (DARK CLIP) [Y]	Color bar	E-E	<p>1. Supply a color bar signal to VIDEO IN.</p> <p>2. Connect the oscilloscope to Y board TP1.</p> <p>3. Refer to the figure and adjust the oscilloscope to set portion A of the waveform (between sync tip and white level) to 4 scale divisions on the oscilloscope.</p> <p>4. Adjust R11 to set the white clip to 3.4 scale divisions and R32 to set the dark clip to 2.0 scale divisions.</p>
5	AFC	TP3 [COLOR]	R68 [COLOR]	Color bar	E-E	<p>1. Supply a color bar signal to VIDEO IN.</p> <p>2. On the Color board, short TP4 and L4.</p> <p>3. Connect a frequency counter to TP3 of the Color board (use 10 Mohm probe).</p> <p>4. Adjust R68 for 625 ± 2 kHz.</p> <p>5. Disconnect the short from TP4 and TP25.</p>
6	VXO	TP26 [COLOR]	R67 [COLOR]	MH-2 Color bar	P.B.	<p>1. Play the color bar signal of the MH-2 alignment tape.</p> <p>2. Connect the frequency counter to C.F. DET TP26 (use 10 Mohm probe).</p> <p>3. Adjust R67 for $4,443,619 \pm 50$ Hz.</p>

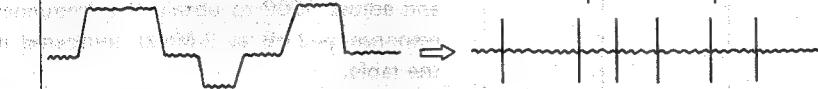
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure																				
7	DUB E-E Out Level	DUB OUT (Pin 1 with 1 kΩ load) VIDEO INPUT: LINE VIDEO AGC: ON	R60 [Y]	Color bar	E-E	<p>1. Supply a color bar signal to VIDEO IN.</p> <p>2. Connect a 1 kohm resistor between pins 1 and 2 of the DUB OUT connector. Then connect the oscilloscope to one of the resistor leads.</p> <p>3. Adjust R60 for 1.0 ± 0.05 Vp-p.</p>																				
			<table border="1"> <tr> <td>DUB IN</td> <td>DUB OUT</td> </tr> <tr> <td>1. Y IN</td> <td>1. Y OUT</td> </tr> <tr> <td>2. GND</td> <td>2. GND</td> </tr> <tr> <td>3. DRUM</td> <td>3. DRUM</td> </tr> <tr> <td>PULSE</td> <td>PULSE</td> </tr> <tr> <td>4. GND</td> <td>4. GND</td> </tr> <tr> <td>5. C. IN</td> <td>5. C. OUT</td> </tr> <tr> <td>6. GND</td> <td>6. GND</td> </tr> <tr> <td>7. C.F.</td> <td>7. C.F.</td> </tr> <tr> <td>PULSE IN</td> <td>PULSE OUT</td> </tr> </table>	DUB IN	DUB OUT	1. Y IN	1. Y OUT	2. GND	2. GND	3. DRUM	3. DRUM	PULSE	PULSE	4. GND	4. GND	5. C. IN	5. C. OUT	6. GND	6. GND	7. C.F.	7. C.F.	PULSE IN	PULSE OUT			
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2. GND	2. GND																									
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6. GND	6. GND																									
7. C.F.	7. C.F.																									
PULSE IN	PULSE OUT																									
8	DUB E-E Input Y Level	TP7 [Y] VIDEO INPUT: DUB	R85 [Y]	Color bar	E-E	<p>1. Supply a color bar signal to VIDEO IN.</p> <p>2. Connect dubbing cable from DUB OUT to DUB IN.</p> <p>3. Connect the oscilloscope to Y board TP7 and adjust R85 for 1.0 ± 0.05 Vp-p.</p>																				
9	DUB Y REC	TP2 [Y] TP4 [Y] TP20 [Y] VIDEO AGC: OFF VIDEO INPUT: LINE → DUB	R36 [Y]	Color bar	E-E	<p>1. Supply a color bar signal to VIDEO IN.</p> <p>2. Set the VIDEO AGC OFF and set the VIDEO LEVEL control to obtain 1.0 Vp-p at VIDEO OUT (75 ohms termination).</p> <p>3. Supply Y signal to DUB IN pins 1 and 2.</p> <p>4. Adjust the DUB IN levels to obtain equal level at Y board TP2 when the VIDEO INPUT switch is operated between LINE and DUB.</p> <p>5. Set the VIDEO INPUT switch to LINE.</p> <p>6. Connect the oscilloscope to Y board TP4. Make a note of the voltage.</p> <p>7. Set the VIDEO INPUT switch to DUB.</p> <p>8. Connect the oscilloscope to Y board TP20. Adjust R36 to obtain the same voltage as measured in above step 6.</p>																				

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure
10	REC Color Level	TP21 [COLOR] TP5 [COLOR] VIDEO INPUT: DUB → LINE	R40 [COLOR] R9 [COLOR]	Color bar Sinewave (650 kHz)	E-E	<p>1. Supply a color bar signal to VIDEO IN. Connect dubbing cable to DUB IN and connect a 75-ohm resistance in series with pins 5 and 6 of the dubbing connector.</p> <p>2. Apply a 650 kHz sinewave and adjust for 0.9 Vp-p between pins 5 and 6.</p> <p>3. Set the video input for the Dub mode and connect the oscilloscope to TP21 of the Color board.</p> <p>4. Adjust R40 for 0.9 Vp-p. Also make a note of the level at TP5 of the Color board.</p> <p>5. Set the VIDEO INPUT to LINE and connect the oscilloscope to Color board TP5. Adjust R9 to obtain the same voltage as measured in above step 4.</p>
11	DUB 7-pin Color Out	TP21 [COLOR]	R10 [COLOR]	Color bar	E-E	<p>1. Supply a color bar signal to VIDEO IN.</p> <p>2. Connect the oscilloscope to Color board TP21.</p> <p>3. Adjust R10 for 0.9 Vp-p.</p>
12	DUB Line E-E Color Out 1	TP2 [COLOR] VIDEO INPUT: DUB	R44 [COLOR]	Sinewave (650 kHz)	E-E	<p>1. Supply a 650 kHz sinewave as described in above item 10.</p> <p>2. Connect the oscilloscope to Color board TP2.</p> <p>3. Adjust R44 for 0.12 Vp-p.</p>
13	REC Y/C Delay	TP6 [Y] TP5 [COLOR] VIDEO INPUT: LINE	R11 [COLOR]	20T Pulse	E-E	<p>1. Supply a 20T pulse to VIDEO IN.</p> <p>2. Connect a dual-trace oscilloscope to Y board TP6 and COLOR board TP5. Set the oscilloscope to MIX.</p> <p>3. Adjust R11 to equalize the lower peripheries of the pulse waveform.</p>
14	REC FM Level	TP1 [PRE/REC] TP2 [PRE/REC] VIDEO INPUT: LINE	R2 [PRE/REC] R11 [PRE/REC]	Color bar	REC	<p>1. Supply a color bar signal to VIDEO IN and set for the REC mode.</p> <p>2. Connect the oscilloscope to TP1 of the Pre/Rec board. Trigger the oscilloscope externally with the signal from Drum Servo board TP24.</p> <p>3. Adjust R2 to set the pedestal to 3.0 Vp-p.</p> <p>4. Refer to and connect the oscilloscope to Pre/Rec board TP2 in the same manner as above step 2.</p> <p>5. Adjust R11 to set the pedestal to 3.0 Vp-p.</p> <p>6. Use a spare tape, record and play back. Connect the oscilloscope to FM Audio board TP37 and check for FM waveform level greater than 76 mVp-p.</p> <p>7. If outside of this specification, in the REC mode, adjust the REC FM level in the range of 0.2 V step down (2.8 V → 2.6 V → 2.4 V). Again check by recording and playback.</p>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure																														
15	Head Resonance Q	NORMAL TP10[PRE/REC] SEARCH TP7[PRE/REC]	NOR CH-1 C30[PRE/REC] R39[PRE/REC] R39[PRE/REC] NOR CH-2 C29[PRE/REC] R38[PRE/REC] SEA CH-1 C65[PRE/REC] R82[PRE/REC] SEA CH-2 C64[PRE/REC] R81[PRE/REC]	Sweep signal	PLAY STILL	<p>1. Connect the oscilloscope to Pre/Rec board TP10.</p> <p>2. Use a blank cassette tape and set for the Play mode.</p> <p>3. Apply sweep signal (approx. 12 mVp-p) to Pre/Rec board TP4. Adjust C30 for $F_0 = 5.3$ MHz. Adjust the oscilloscope to set the 100 kHz level to 3 scale divisions, then adjust R39 to set the 5.3 MHz level to 5 scale divisions.</p> <p>4. Apply the sweep signal to TP3.</p> <p>5. Connect the oscilloscope to Pre/Rec board TP7. Set for the Still mode and again adjust in the same manner as above step 3.</p>																														
						<table border="1"> <thead> <tr> <th>Mode</th><th>Signal input</th><th>GND</th><th>Check point</th><th>fo</th><th>Q</th></tr> </thead> <tbody> <tr> <td>NOR CH-1</td><td>TP4</td><td>TP20</td><td>TP10</td><td>C30</td><td>R39</td></tr> <tr> <td>NOR CH-2</td><td>TP3</td><td>TP21</td><td>TP10</td><td>C29</td><td>R38</td></tr> <tr> <td>SEA CH-1</td><td>TP6</td><td>TP22</td><td>TP7</td><td>C65</td><td>R82</td></tr> <tr> <td>SEA CH-2</td><td>TP5</td><td>TP22</td><td>TP7</td><td>C64</td><td>R81</td></tr> </tbody> </table>	Mode	Signal input	GND	Check point	fo	Q	NOR CH-1	TP4	TP20	TP10	C30	R39	NOR CH-2	TP3	TP21	TP10	C29	R38	SEA CH-1	TP6	TP22	TP7	C65	R82	SEA CH-2	TP5	TP22	TP7	C64	R81
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						<p>Notes:</p> <ul style="list-style-type: none"> • This adjustment is required after replacing the upper drum assembly. • If the sweep generator has a trigger output, trigger the oscilloscope externally with this signal. 																														
16	P.B. Color CH Balance	TP14[PRE/REC] TP7[PRE/REC]	R44[PRE/REC] R87[PRE/REC]	MH-2	PLAY PLAY ↓ STILL	<p>1. Connect the oscilloscope to TP14 of the Pre/Rec board. Trigger the oscilloscope externally with the signal from Drum Servo board TP24.</p> <p>2. Play the color bar signal of the MH-2 alignment tape.</p> <p>3. Set the TRACKING control for maximum waveform. Adjust R44 to equalize the CH-1 and CH-2 levels.</p> <p>4. In the Still mode, turn the pinch roller to produce the search head waveform and made a note of this level.</p> <p>5. Reverse the oscilloscope trigger and adjust R87 to obtain the same level as measured in the above step 4.</p> 																														

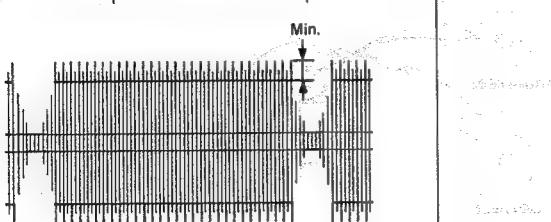
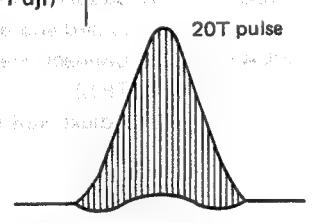
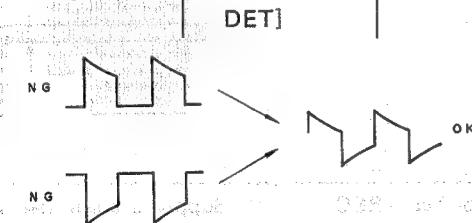
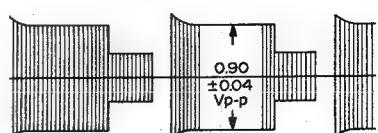
No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure
17	P.B. Color Level	TP14[PRE/REC] R143[PRE/REC] R1[PRE/REC] R10[PRE/REC]	MH-2 Color bar	PLAY REC ↓ PLAY		<p>1. Connect the oscilloscope to TP14 of the Pre/Rec board. Trigger the oscilloscope externally with the signal from Drum Servo board TP24.</p> <p>2. Play the color bar signal of the MH-2 alignment tape.</p> <p>3. Adjust R143 for 0.4 Vp-p waveform.</p> <p>4. Record and play back a color bar signal. At (–) trigger slope, adjust R1 for 0.44 Vp-p, and at (+) trigger slope, adjust R10 for 0.44 Vp-p.</p>
18	Search FM Delay	TP7[PRE/REC] IC13 pin 3 IC14 pin 6 IC14 pin 3 [PRE/REC]	R162[PRE/REC] R123[PRE/REC] R128[PRE/REC]	MH-2	STILL	<p>1. Play the color bar signal of the MH-2 alignment tape and set for the Still mode.</p> <p>2. Connect the oscilloscope to Pre/Rec board TP7 and adjust R162 for 0.25 Vp-p.</p> <p>3. Connect the oscilloscope to Pre/Rec board IC13 pin 3 and adjust R162 for maximum level.</p> <p>4. Confirm 0.15 ± 0.05 Vp-p at IC14 pin 6.</p> <p>5. Connect the oscilloscope to Pre/Rec board IC14 pin 3 and adjust R128 for maximum level.</p>
19	Search FM Level	TP8[PRE/REC] TAPE: T-120SHG (JVC or Fuji)	R135[PRE/REC]	Color bar	REC ↓ PLAY	<p>1. Supply a color bar signal to VIDEO IN.</p> <p>2. Connect the oscilloscope to TP8 of the Pre/Rec board. Trigger the oscilloscope externally with the signal from Drum Servo board TP24.</p> <p>3. Record and play back the color bar signal. Make a note of the FM level.</p> <p>4. Play back in the Still mode and adjust R135 for equal level as measured in the above step 3.</p>
20	Search Skew	Monitor TV	R110[PRE/REC] R111[PRE/REC] R135[PRE/REC]	MH-2	STILL	<p>1. Play the color bar signal of the MH-2 alignment tape and set for the Still mode.</p> <p>2. Connect a monitor to VIDEO OUT. Adjust R110 and R111 to minimize skew distortion.</p> <p>3. Adjust R135 to minimize noise amplitude as observed on the monitor.</p>
21	V. Pulse Timing	TP12[PRE/REC] S1: ON [PRE/REC]	R101[PRE/REC]	MH-2	STILL	<p>1. Play the stairstep signal of the MH-2 alignment tape and set for the Still mode. Check that the Pre/Rec board switch is ON (observed from left side of the front panel side. Right position is ON).</p> <p>2. Connect the oscilloscope to TP12 of the Pre/Rec board. Trigger the oscilloscope externally with the signal from Drum Servo board TP24. Set slope to (+).</p> <p>3. Adjust R101 for 300 μs between the TP24 waveform rise and TP12 waveform fall.</p> <p>4. Set the slope to (–) and confirm the $300 \pm 30 \mu$s to TP waveform fall. Also check for TP12 pulse width of $415 \pm 40 \mu$s.</p>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure
22	P.B. Frequency Response Channel Balance	TP22 [Y] R39[PRE/REC] R38[PRE/REC] R62[PRE/REC]	R66[PRE/REC] R39[PRE/REC] R38[PRE/REC] R62[PRE/REC]	MH-8	PLAY	<p>1. Play the color sweep signal of the MH-8 alignment tape.</p> <p>2. Connect the oscilloscope to Y board TP22. Trigger the oscilloscope externally with the signal from Drum Servo board TP24. Use (+) slope for CH-2 and (-) slope for CH-1.</p> <p>3. Turn Pre/Rec board R66 to minimize high frequency response.</p> <p>4. Check for channel difference within 1 dB at 2 MHz. If necessary, adjust the higher channel level to match the lower (R39 for CH-1 and R38 for CH-2).</p> <p>5. Adjust the oscilloscope to the 100 kHz level to 4.0 scale divisions. Then adjust R62 to set the 2 MHz level to 3.0 scale divisions.</p>
23	P.B. Color B/W Y Level	TP14 [Y]	R159 [Y] R148 [Y]	Color bar	REC ↓ PLAY	<p>1. Supply a color bar signal to VIDEO IN, record and play back. Set the Video mode to COLOR.</p> <p>2. Connect the oscilloscope to Y board TP14. Adjust R159 for 0.55 Vp-p.</p> <p>3. Record and play back a color bar signal in the B/W mode.</p> <p>4. Adjust R148 for 0.5 Vp-p at TP14.</p>
24	20T Pulse Phase EQ	TP14 [Y] VIDEO INPUT: LINE TAPE: T-120SHG (JVC or Fuji)	R163 [Y] R152 [Y]	20T Pulse	REC ↓ PLAY	<p>1. Supply a 20T pulse to VIDEO IN.</p> <p>2. Connect the oscilloscope to Y board TP14.</p> <p>3. So that the ringing component of the 2T pulse is symmetrical left and right, adjust R163 for the Color mode and R152 for the B/W mode.</p> 
25	Video Frequency Response	TP18 [Y] VIDEO MODE: COLOR	R170 [Y] R82[PRE/REC] R81[PRE/REC]	MH-8	PLAY	<p>1. Connect the oscilloscope to Y board TP18. Trigger the oscilloscope externally with the signal from Drum Servo board TP24.</p> <p>2. Play the MH-8 alignment tape.</p> <p>3. Adjust the oscilloscope to set the 100 kHz level to 5 scale divisions. Then adjust R170 to set the 2 MHz level to 4.5 scale divisions.</p> <p>4. In the Still mode, use (+) slope and turn the pinch roller to produce the waveform.</p> <p>5. Adjust the oscilloscope to set the 100 kHz level to 5 scale divisions. Then adjust R82 to set the 2 MHz level to 4.5 scale divisions.</p> <p>6. Use (-) slope and adjust R81 in the same manner.</p>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure																		
26	H. Correlation Noise Cancel	TP24 [Y] VIDEO MODE: COLOR TAPE: T-120SHG (JVC or Fuji)	R233 [Y]	Color bar	REC ↓ PLAY	<ol style="list-style-type: none"> Supply a color bar signal to VIDEO IN, record and play back. Connect a 0.022 μF capacitor between Y board TP24 and GND. Connect the oscilloscope to TP24 and adjust R233 for minimum level. 																		
27	P.B. Video Out Y Level	VIDEO OUT DUB OUT (Pin 1 with 1 k Ω load) TAPE: T-120SHG (JVC or Fuji)	R223 [Y] R224 [Y]	Color bar	REC ↓ PLAY	<ol style="list-style-type: none"> Supply a color bar signal to VIDEO IN, record and play back. Terminate DUB OUT pins 1 and 2 at 1 kohm and connect the oscilloscope. Adjust R224 for 1.00 Vp-p. Terminate VIDEO OUT at 75 ohm and connect the oscilloscope. Adjust R223 for 1.00 Vp-p. 																		
28	Video Frequency Response (2)	TP18 [Y] VIDEO MODE: COLOR VIDEO MODE: B/W	R170 [Y] R157 [Y]	MH-8	PLAY	<ol style="list-style-type: none"> Play the MH-8 alignment tape. Connect the oscilloscope to Y board TP18. Trigger the oscilloscope externally with the signal from Drum Servo board TP24. Adjust the oscilloscope to set the 100 kHz level to 5 scale divisions. Then adjust R170 to set the 2 MHz level to 4.5 scale divisions (-1.0 dB). Confirm the following values. <table border="1"> <tr> <td>Freq.</td> <td>100 kHz = 5.0 div.</td> <td>100 kHz = 0 dB</td> </tr> <tr> <td>1 MHz</td> <td>6.3 – 4.5</td> <td>0⁺²₋₁ dB</td> </tr> <tr> <td>2 MHz</td> <td>4.5</td> <td>-1.0 dB</td> </tr> </table> <ol style="list-style-type: none"> Set Video mode to B/W. Adjust the oscilloscope to set the 100 kHz level to 5 scale divisions. Then adjust R157 to set the 2 MHz level to 4.5 scale divisions (-1.0 dB). Confirm the following values. <table border="1"> <tr> <td>Freq.</td> <td>100 kHz = 5.0 div.</td> <td>100 kHz = 0 dB</td> </tr> <tr> <td>1 MHz</td> <td>6.3 – 4.5</td> <td>0⁺²₋₁ dB</td> </tr> <tr> <td>2 MHz</td> <td>4.5</td> <td>-1.0 dB</td> </tr> </table>	Freq.	100 kHz = 5.0 div.	100 kHz = 0 dB	1 MHz	6.3 – 4.5	0 ⁺² ₋₁ dB	2 MHz	4.5	-1.0 dB	Freq.	100 kHz = 5.0 div.	100 kHz = 0 dB	1 MHz	6.3 – 4.5	0 ⁺² ₋₁ dB	2 MHz	4.5	-1.0 dB
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2 MHz	4.5	-1.0 dB																						
29	Noise Cancel	VIDEO OUT LINE (VIDEO) MODE SW: MODE 2 VIDEO MODE: B/W TAPE: T-120SHG (JVC or Fuji)	R211 [Y]	Stairstep	REC ↓ PLAY	<ol style="list-style-type: none"> Supply a stairstep signal to VIDEO IN, record and play back. Terminate VIDEO OUT at 75 ohms and connect the oscilloscope. Adjust R211 for minimum noise at 50% white. (Use delay function for oscilloscope when adjusting.) <p>Alternate method:</p> <ol style="list-style-type: none"> Connect a video noise meter to VIDEO IN and VIDEO OUT. Set Video mode to Color, record and play back a 50% white signal. Adjust R211 for optimum S/N. 																		

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure												
30	Aperture	VIDEO OUT VIDEO MODE: COLOR LINE(VIDEO) MODE SW: MODE 2	R206 [Y]	MH-8	PLAY	<p>1. Terminate VIDEO OUT at 75 ohms and connect the oscilloscope. Trigger the oscilloscope externally with the signal from Drum Servo board TP24.</p> <p>2. Play the MH-8 alignment tape.</p> <p>3. Set the LINE mode switch to MODE 2 and adjust R206 to obtain the frequency response (-2 dB at 2 MHz) indicated in the table.</p> <table border="1"> <tr> <td>Freq.</td> <td>100 kHz = 5.0 div.</td> <td>100 kHz = 0 dB</td> </tr> <tr> <td>1 MHz</td> <td>6.3 - 4.5</td> <td>0⁺² dB</td> </tr> <tr> <td>2 MHz</td> <td>4.0</td> <td>-2.0 ± 2 dB</td> </tr> <tr> <td>2.5 MHz</td> <td>4.5 - 2.2</td> <td>-4.0 ± 3 dB</td> </tr> </table>	Freq.	100 kHz = 5.0 div.	100 kHz = 0 dB	1 MHz	6.3 - 4.5	0 ⁺² dB	2 MHz	4.0	-2.0 ± 2 dB	2.5 MHz	4.5 - 2.2	-4.0 ± 3 dB
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2.5 MHz	4.5 - 2.2	-4.0 ± 3 dB																
31	DUB Mode E-E Line Out	VIDEO OUT VIDEO INPUT: DUB VIDEO MODE: COLOR	R98 [Y] R102 [Y]	Color bar Sinewave (650 kHz)	E-E	<p>1. Connect dubbing cable to DUB IN and supply a Y signal to pins 1 and 2. Insert a 75 ohm resistance in series with pins 5 and 6, and apply a 650 kHz sinewave.</p> <p>2. Adjust the oscillator output for 0.9 Vp-p between pins 5 and 6.</p> <p>3. Terminate VIDEO OUT at 75 ohms and connect the oscilloscope.</p> <p>4. Adjust R98 to set the Y level to 1.0 Vp-p.</p> <p>5. Adjust R102 to set the burst level to 0.28 Vp-p.</p>												
32	APC Filter	TP22 [COLOR] TP15 [COLOR] VIDEO MODE: COLOR	R208 [COLOR] R211 [COLOR]	Color bar	REC ↓ PLAY	<p>1. Supply a color bar signal to VIDEO IN, record and play back.</p> <p>2. Connect the oscilloscope to Color board TP22. Trigger the oscilloscope externally with the signal from Drum Servo board TP24.</p> <p>3. Adjust R208 so that $t_1 = 1.56$ ms.</p> <p>4. Connect the oscilloscope to Color board IC18 pin 6.</p> <p>5. Adjust R211 so that $t_2 = 1.80$ ms.</p>												
33	PB ACC IN	TP2 [COLOR]	R47 [COLOR]	MH-2	PLAY	<p>1. Play the color bar signal of the MH-2 alignment tape.</p> <p>2. Connect the oscilloscope to Color board TP2. Trigger the oscilloscope externally with the signal from Drum Servo board TP24.</p> <p>3. Adjust R47 for 0.15 Vp-p waveform.</p> <p>Note: Set TRACKING to maximum.</p>												

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure
34	DG	TP15 [COLOR] VIDEO OUT VIDEO MODE: COLOR TAPE: T-120SHG (JVC or Fuji)	R186 [COLOR]	Stairstep	REC ↓ PLAY	<p>1. Supply a stairstep signal to VIDEO IN, record and play back.</p> <p>2. Connect the oscilloscope to Color board TP15.</p> <p>3. Connect a vectorscope to VIDEO OUT (terminate at .75 ohms).</p> <p>4. Adjust R186 to where the oscilloscope waveform is flat, while the vectorscope dots are converged.</p>
35	Crosstalk Cancel	VIDEO OUT VIDEO MODE: COLOR	R101 [COLOR] L14 [COLOR]	Color bar	REC ↓ PLAY	<p>1. Supply a color bar signal to VIDEO IN, record and play back.</p> <p>2. Connect a monitor-TV to VIDEO OUT.</p> <p>3. Adjust the TRACKING for minimum FM level as observed on the VIDEO meter.</p> <p>4. Mutually adjust R101 and L14 to eliminate 2H interval noise from the picture.</p>
36	Comb Balance	TP12 [COLOR]	R66 [COLOR]	Color bar	REC ↓ PLAY	<p>1. Supply a color bar signal to VIDEO IN, record and play back.</p> <p>2. Connect the oscilloscope to Color board TP12.</p> <p>3. Adjust R66 for minimum noise level.</p>
37	Color Noise Level	TP18 [COLOR] TAPE: T-120SHG (JVC or Fuji)	R148 [COLOR]	Color bar	REC ↓ PLAY	<p>1. Supply a color bar signal to VIDEO IN, record and play back.</p> <p>2. Connect the oscilloscope to Color board TP18.</p> <p>3. Adjust R148 for minimum level.</p>

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure
38	DUB Cross-talk Cancel	VIDEO MODE: COLOR TAPE: T-120SHG (JVC or Fuji)	TP21 [COLOR] R154 [COLOR] R131 [COLOR]	Color bar	REC ↓ PLAY	<p>1. Supply a color bar signal to VIDEO IN, record and play back.</p> <p>2. Connect the oscilloscope to Color board TP20.</p> <p>3. Set R154 to its mechanical center position.</p> <p>4. Turn the TRACKING control from the detent position to where serration occurs in the color signal waveform envelope. Adjust R131 to minimize the serration. (Turn the TRACKING control fully clockwise or counterclockwise to increase the serration level.)</p> <p>5. Set the oscilloscope TIME/DIV to 1 ms or 0.5 ms. Turn R154 fully clockwise (as viewed from parts side of board), then adjust it to where serration is minimized, but just prior to where chroma level change occurs.</p> 
39	P.B. Y/C Delay	VIDEO OUT DUB OUT VIDEO MODE: COLOR TAPE: T-120SHG (JVC or Fuji)	R149 [PRE/REC] R172 [COLOR]	20T Pulse	REC ↓ PLAY	<p>1. Supply a 20T pulse to VIDEO IN, record and play back.</p> <p>2. Connect the oscilloscope to VIDEO OUT. Terminate at 75 ohms.</p> <p>3. Adjust R149 to equalize the left and right peripheries of the modulated 20T pulse.</p> <p>4. Terminate DUB OUT connector pins 1 and 2 at 1 kohm, and pins 5 and 6 at 1 kohm. Then connect a dual trace oscilloscope.</p> <p>5. Set the oscilloscope to the MIX function.</p> <p>6. Adjust R172 to equalize the left and right peripheries of the modulated 20T pulse.</p> 
40	P.B. 135° Burst	TP11 [COLOR]	R260 [C.F. DET]	Color bar	REC ↓ PLAY	<p>1. Supply a color bar signal to VIDEO IN, record and play back.</p> <p>2. Connect the oscilloscope to Color board TP11.</p> <p>3. Adjust R260 for symmetrical upper and lower sections of the waveform.</p> 
41	P.B. DUB OUT Color Level	DUB OUT VIDEO MODE: COLOR TAPE: T-120SHG (JVC or Fuji)	R174 [COLOR]	Color bar	REC ↓ PLAY	<p>1. Supply a color bar signal to VIDEO IN, record and play back.</p> <p>2. Terminate DUB OUT connector pins 5 and 6 at 1 kohm. Then connect the oscilloscope.</p> <p>3. Adjust R174 for 0.90 ± 0.04 Vp-p waveform.</p> 

No.	Item	Check Point	Adjustment Parts	Signal	Mode	Adjustment Procedure
42	P.B. VIDEO OUT Color Level	VIDEO OUT VIDEO MODE: COLOR TAPE: T-120SHG (JVC or Fuji)	R136 [Y]	Color bar	REC ↓ PLAY	<ol style="list-style-type: none"> Supply the color-bars signal of the alignment tape to VIDEO IN, and record and play it back. Terminate VIDEO OUT at 75 ohm, and connect the probe. Adjust R136 so that burst level becomes 0.280 Vp-p.
43	Tracking Meter	TRACKING METER VIDEO INPUT: LINE VIDEO MODE: COLOR TAPE: T-120SHG (JVC or Fuji)	R135 [COLOR]	Color bar	REC ↓ PLAY	<ol style="list-style-type: none"> Supply the color-bars signal of the alignment tape to VIDEO IN, and record and play it back. Turn the TRACKING control to set it to the center click position. Adjust R135 so that the tracking meter's indication is in 3.5 scale divisions.
44	Video Meter	VIDEO METER VIDEO INPUT: LINE VIDEO MODE: COLOR	R137 [COLOR]	Color bar	E-E	<ol style="list-style-type: none"> Supply the color-bars signal to VIDEO IN. Adjust R137 to set the video meter's indication at the center of the green zone. <p>Note: Adjustments of this item should be performed 2 minutes after the power has been turned on.</p>

SECTION 4 CHARTS AND DIAGRAMS

4.1 KEY TO ABBREVIATIONS

A	ACC	: Automatic Color Control	CONN	: Connector
	ADD	: Adder	CT	: Ceramic Trap
	ADC	: Analog to Digital Converter	CTC	: Crosstalk Cancel
	ADJ	: Adjustment	CTL	: Control
	A DUB	: Audio Dubbing	D	: Drum
	AE	: Audio Erase	DAC	: Digital to Analog Converter
	AEF	: Automatic Edition Function	DD	: Direct Drive
	AFC	: Automatic Frequency Control	DEC	: Decoder
	AFT	: Automatic Fine Tuning	DEMOD	: Demodulator
	AGC	: Automatic Gain Control	DET	: Detector
	AH	: Audio Head	DEV	: Deviation
	AL	: After Loading	DFRS	: Drum-Free RUN-STOP
	ALC	: Automatic Level Control	DIF TRANS	: Differential Transformer
	ALM	: Alarm	DISCR	: Discriminator
	AM	: Amplitude Modulation	DL	: Delay Line
	AMP	: Amplifier	DOC	: Dropout Compensator
	ANT	: Antenna	DRUM FF	: Drum Flip Flop
	APC	: Automatic Phase Control	DUB	: Dubbing
	APL	: Average Picture Level	E	: Edit, Erase
	ASSEM	: Assembly	EDP	: Electronic Data Processing
	ASS'Y	: Assembly	E-E	: Electric to Electric
	ATT	: Attenuator	EF	: Emitter-Follower
	AUTO	: Automatic	EMPHA	: Emphasis
	AUX	: Auxiliary	EMG	: Emergency
	AUD	: Audio	ENC	: Encoder
B	B	: Brake	EN	: Enable
	BAL	: Balance	EQ	: Equalizer
	BATT	: Battery	ESNS	: End Sensor
	BCD	: Binary Coded Decimal	EXP	: Expander
	BEG	: Beginning	EXT	: External
	BFP	: Burst Flag Pulse	F	: Full Erase
	BIT	: Binary Digit	FF	: Fast Forward
	BLK	: Black	FFL	: Flipflop
	BLU	: Blue	FG	: Frequency Generator
	BNC	: Bayonet connector	FM	: Frequency Modulation
	BPF	: Bandpass Filter	FMA	: FM Audio
	BRN	: Brown	FREQ	: Frequency
	BRT	: Brightness	F-V CONV	: Frequency to Voltage Converter
	B. SOL	: Brake Solenoid	FWD	: Forward
	B/W	: Black and White	G	: Grass Delay Line
C	C	: Ceramic	GEN LOCK	: Generator Lock
	CAP	: Capstan	GND	: Ground
	CASS	: Cassette	GRN	: Green
	CF	: Ceramic Filter, color Frame	GRY	: Gray
	CC	: Cassette compartment	H	: High, Horizontal
	CE	: Chip Enable	HG	: Hall Generator
	CH	: Channel	HPF	: Highpass Filter
	CHROMA	: Chrominance	I	: Intermediate Frequency
	CLK	: Clock	IFT	: Intermediate Frequency Transformer
	CLR	: Clear	IND	: Indicator
	CMD	: Command	INH	: Inhibit
	CNT	: Count, Counter	INS	: Insert
	CONV	: Converter	INT	: Internal, Interrupt
	COL	: Color	INV	: Inverter
	COM	: Common	I/O	: Input/Output
	COMP	: Comparator		
		: Composite		
		: Compensation		

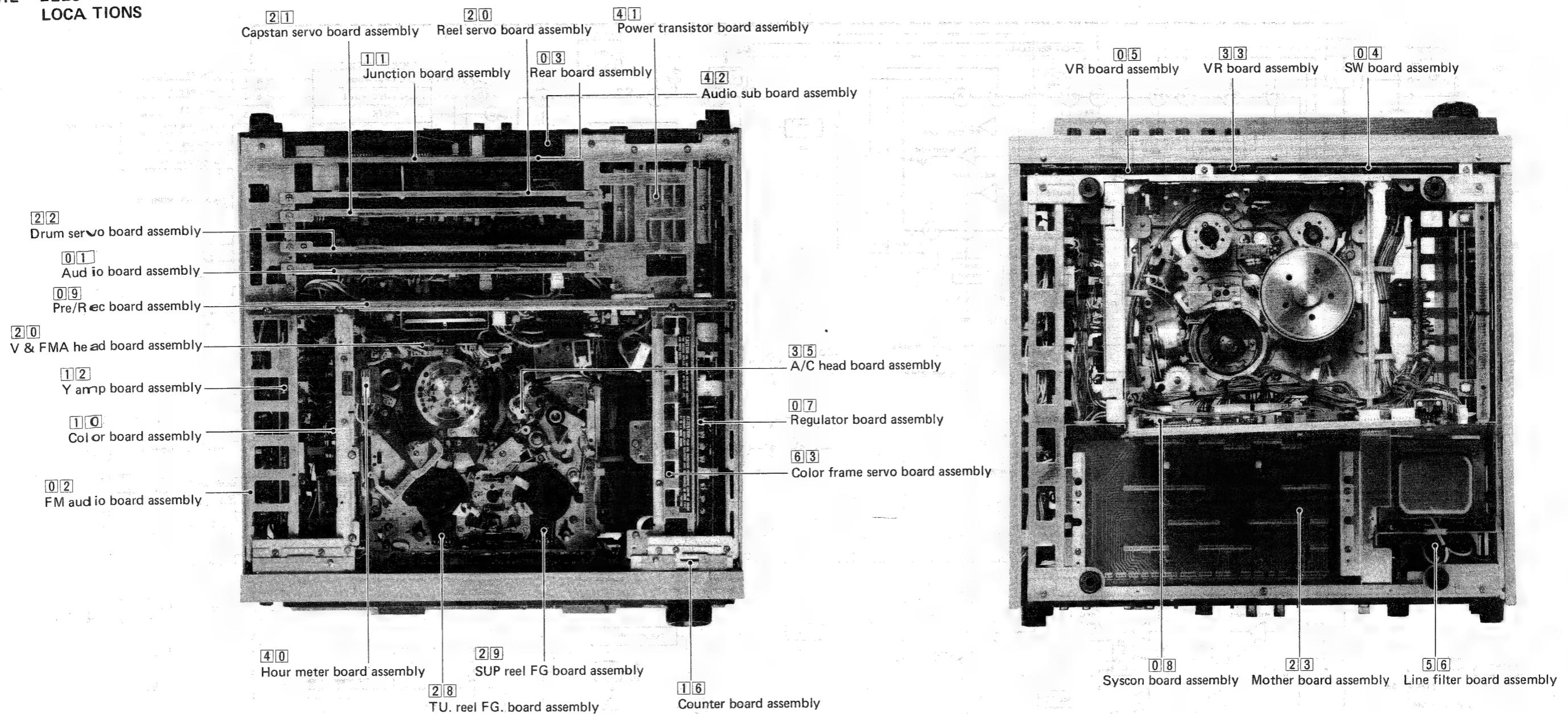
AUDIOVIDEO GLOSSARY

L	L	: Low
LCD		: Liquid Crystal Display
LE		: Loading End
LED		: Light Emitting Diode
LIN		: Linearity
LIM		: Limiter
LOAD		: Loading
LP		: Long Play
LPF		: Lowpass Filter
LT		: Loading Tension
M	MAX	: Maximum
MDA		: Motor Drive Amplifier
MIC		: Microphone
MIN		: Minimum
MIX		: Mixer
MM		: Monostable Multivibrator
MOD		: Modulator
MON		: Monitor
MOS		: Metal Oxide Semkonductor
MPX		: Multiplexer
MS		: Mode Select
MUT		: Muting
N	NC	: Noise Cancel
NFB		: Negative Feedback
NO		: Normally Open
O	OPAMP	: Operational Amplifier
OP		: Operation
ORN		: Orange
OSC		: Oscillator
P	PB	: Playback
PC		: Photocoupler
PCM		: Pulse Code Modulation
PGM		: Program
PG		: Pulse Generator
PI		: Photo Interrupter
PLL		: Phase Locked Loop
POS		: Position
PR		: Pinch Roller
PREV		: Preview
PRL		: Preroll
PU		: Pickup
PWB		: Printed Wiring Board
Q	Q	: Quality Factor
R	RA	: Resistor Array
		: Random Access
RAM		: Random Access Memory
REC		: Recording
REG		: Regulated
REV		: Reverse
REW		: Rewind
RF		: Radio Frequency
RST		: Reset
R/P		: Record/Playback
RPT		: Repeat
RT		: Rotary Transformer
RY		: Relay

S	S	: Search, Servo
SC		: Subcarrier
SEAR		: Search
SEL		: Select
SENS		: Sensor
SEP		: Separator
SF		: Source Follower
SFF		: Short Fast Forward
SFWD		: Search Forward
SI		: Serial In
SIG		: Signal
SO		: Serial Out
SOL		: Solenoid
SOS		: Sound on Sound
SP		: Standard Play
SR		: Supply Reel
SREV		: Search Reverse
SREW		: Short Rewind
SSG		: Sync Signal Generator
STL		: Still
SUP		: Supply
SYNC		: Synchronization
SYSCON		: System control
T	TBC	: Time Base Corrector
	TC	: Tension Control, Time Code
	TDG	: Time Date Generator
	T.EALM	: Tape End Alarm
	TEN	: Tension
	TIM	: Timing
	TK	: Tracking
	TL	: Time Lapse
	TREC	: Timer Record
	TSW	: Time Switch
	TU	: Take-up
	TUR	: Take-up Reel
U	UNLD	: Unloading
	UNREG	: Unregulated
	UNSW	: Unswitched
V	V	: Video, Vertical
	VCO	: Voltage Controlled Oscillator
	VD	: Vertical Drive
	V XO	: Variable Crystal Oscillator
	VLT	: Violet
	VSCH	: Variable Search
W	WHT	: White
	WV	: Working Voltage
	WARN	: Warning
X	XTL	: Crystal
Y	Y	: Luminance
	YLW	: Yellow

4.2 ELECTRICAL PARTS LOCATIONS

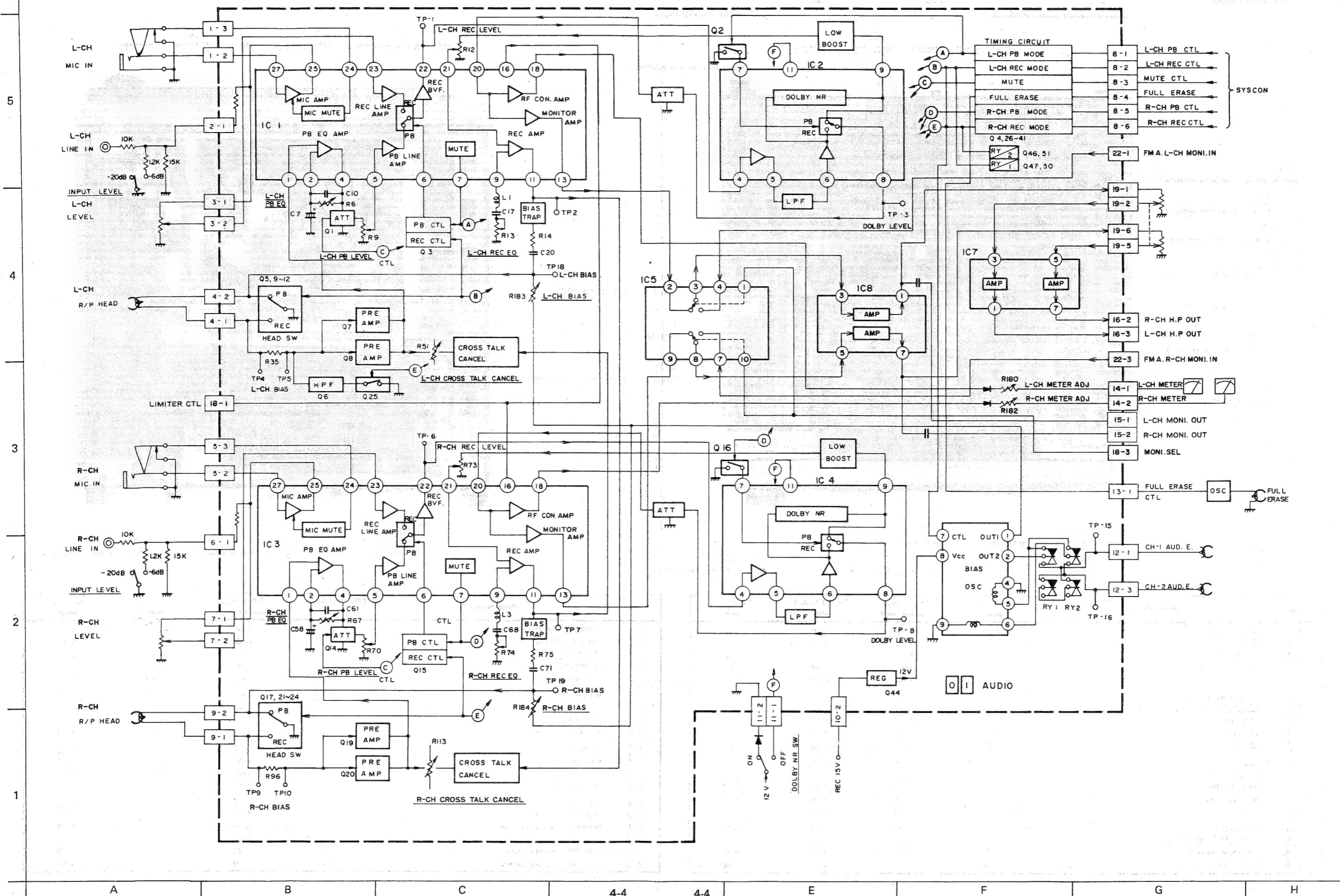
TAKEUCHI WALKIE TALKIE 4-3



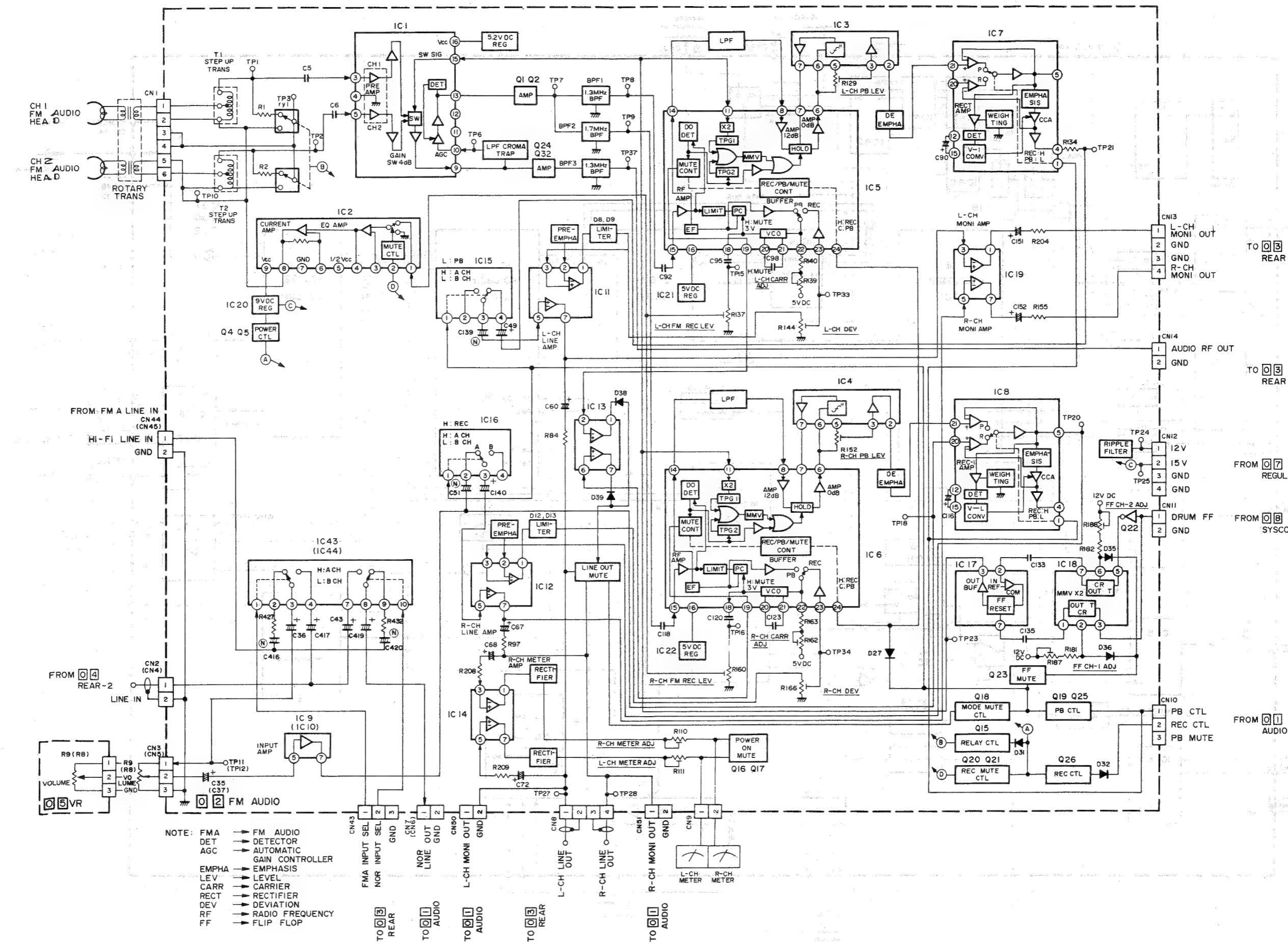
No.	PWB Name	Block diagram page	Schematic diagram page	Circuit board page	Parts list page
01	AUDIO	4-4	4-14	4-15	6-6
02	FM AUDIO	4-5	4-15	4-17	6-11
03	REAR (1)	—	4-47	4-45	6-16
04	SW	—	4-47	4-44	6-16
05	VR (1)	—	4-48	4-44	6-16
06	FULL ERASE HEAD	—	4-47	4-15	6-16
07	REGULATOR	—	4-18	4-19	6-17
08	SYSCON	4-6	4-20	4-21	6-18
09	PRE/REC	4-7	4-22	4-23	6-22
10	COLOR	4-8	4-24	4-25	6-26
11	JUNCTION	—	4-28	4-29	6-31
12	Y AMP	4-9	4-26	4-27	6-32
13	END SENSOR	—	4-46	4-43	6-37
14	OPERATION	—	4-28	4-29	6-38
15	LED	—	4-46	4-43	6-38
16	COUNTER	—	4-30	4-31	6-39
18	CASSETTE HOUSING	—	4-46	4-43	6-40
19	V & FMA HEAD	—	4-30	4-31	6-40
20	REEL SERVO	4-10	4-32	4-33	6-40

No.	PWB Name	Block diagram page	Schematic diagram page	Circuit board page	Parts list page
21	CAPSTAN SERVO	4-11	4-34	4-35	6-44
22	DRUM SERVO	4-12	4-36	4-37	6-47
23	MOTHER	—	4-46	4-41	6-51
24	SEARCH VR	—	4-46	4-42	6-51
25	FRONT LED	—	4-47	4-42	6-51
26	REAR (2)	—	4-47	4-45	6-51
28	TU. REEL FG.	—	4-46	—	6-51
29	SUP REEL FG.	—	4-46	—	6-51
30	JACK	—	4-47	4-42	6-52
32	DISPLAY	—	4-30	4-31	6-52
33	VR (2)	—	4-48	4-44	6-52
34	VR (3)	—	4-48	4-44	6-52
35	A/C HEAD	—	4-47	4-15	6-52
38	PICH-UP DET.	—	4-46	4-43	6-52
40	HOUR METER	—	4-47	4-43	6-52
41	POWER TRANSISTOR	—	4-18	—	6-52
42	AUDIO SUB	—	4-40	4-40	6-53
46	COLOR FRAME SUB	—	4-38	4-38	6-53
63	COLOR FRAME SERVO	4-12	4-38	4-39	6-53

4.3 AUDIO BLOCK DIAGRAM

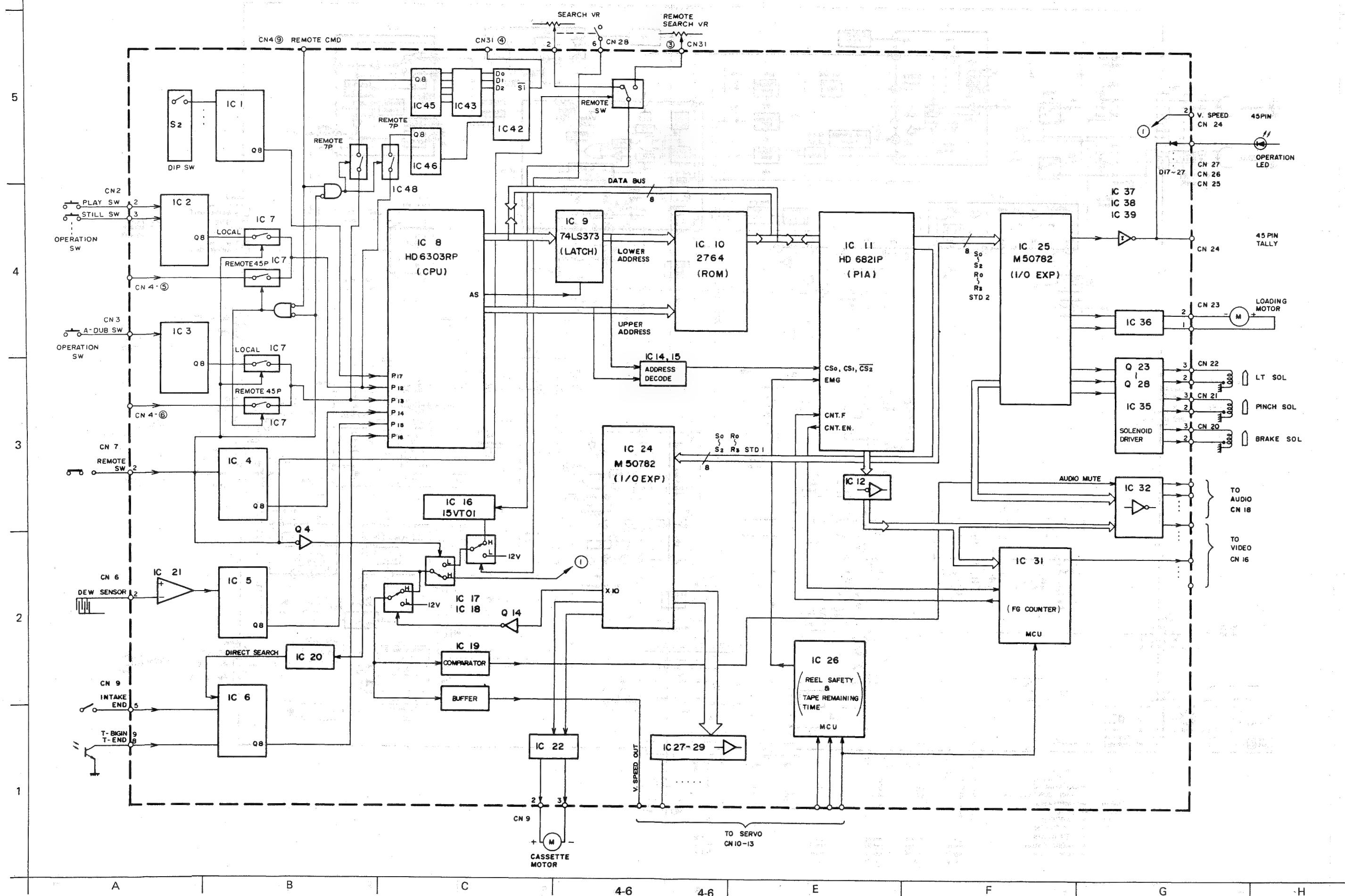


4.4 FM AUDIO BLOCK DIAGRAM

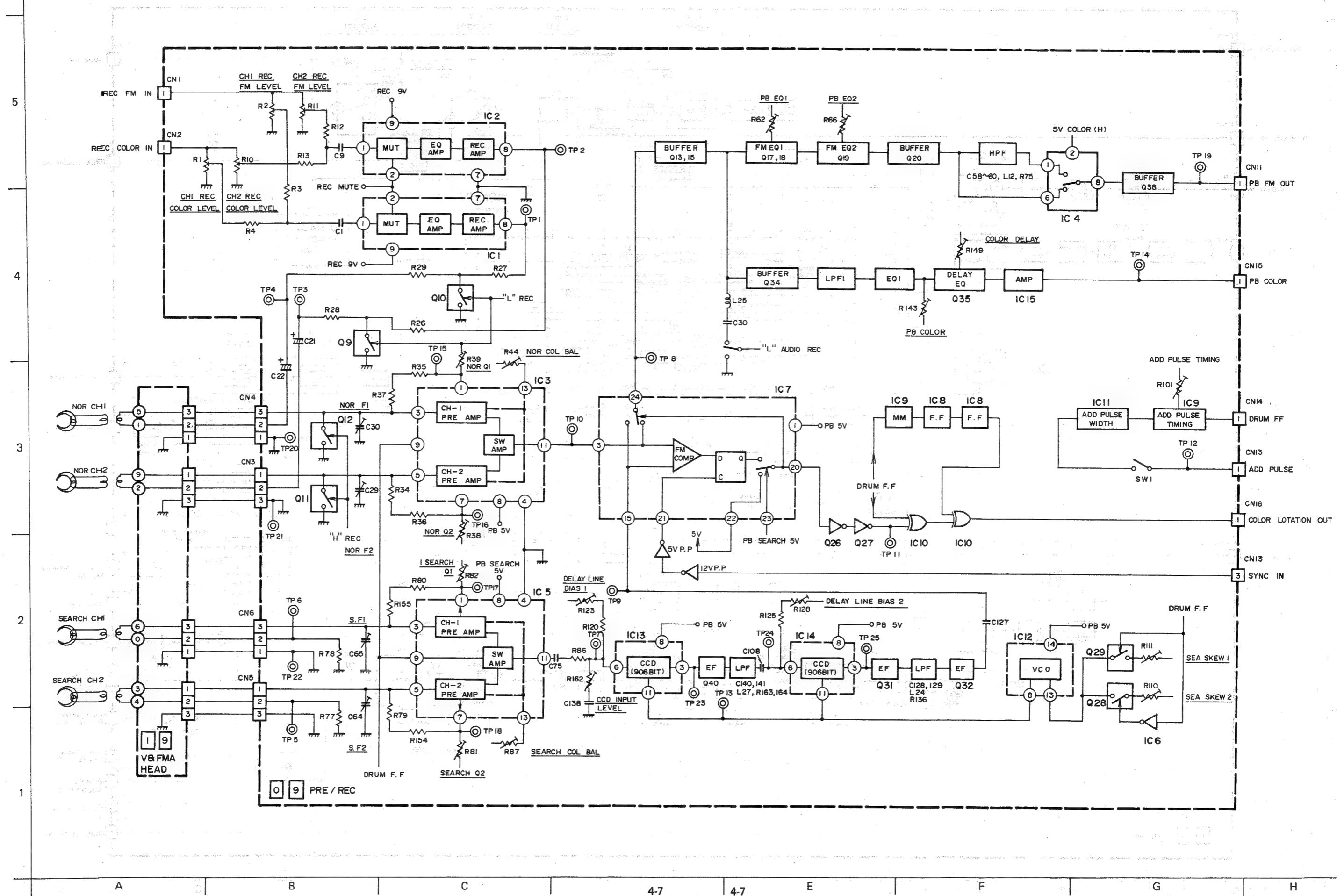


4.5 SYSTEM CONTROL BLOCK DIAGRAM

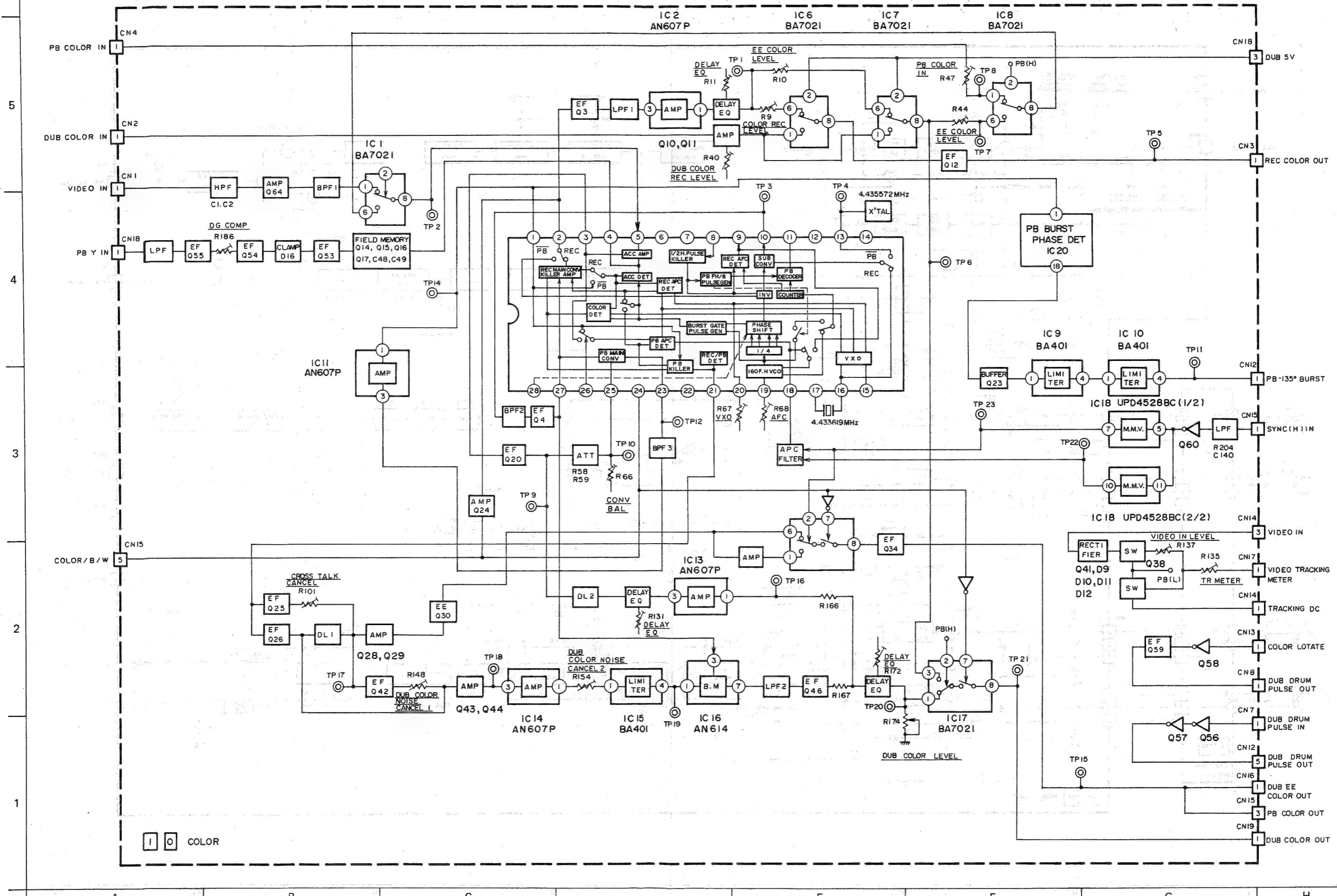
SYSTEM CONTROL BLOCK DIAGRAM



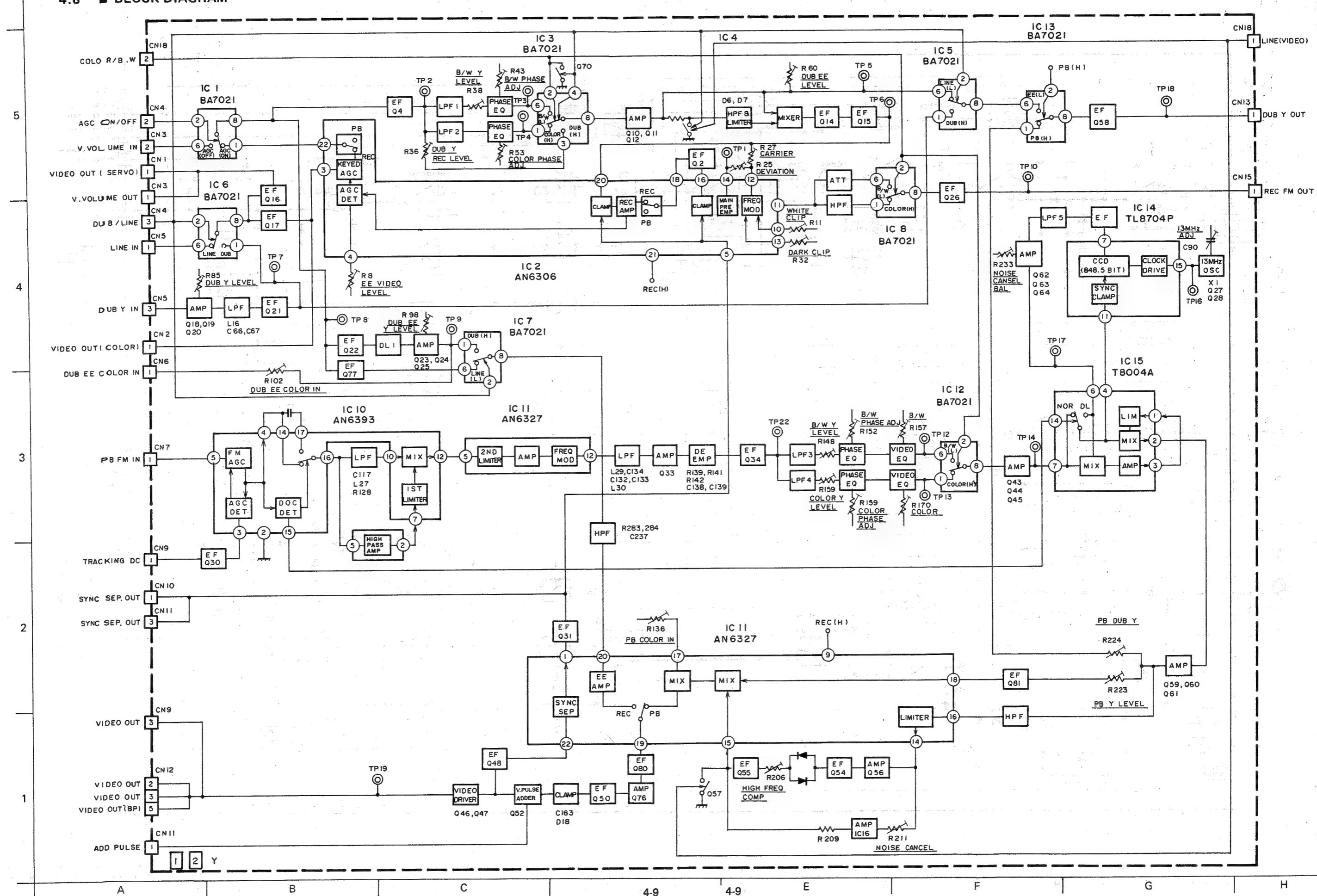
4.6 PRE/REC BLOCK DIAGRAM



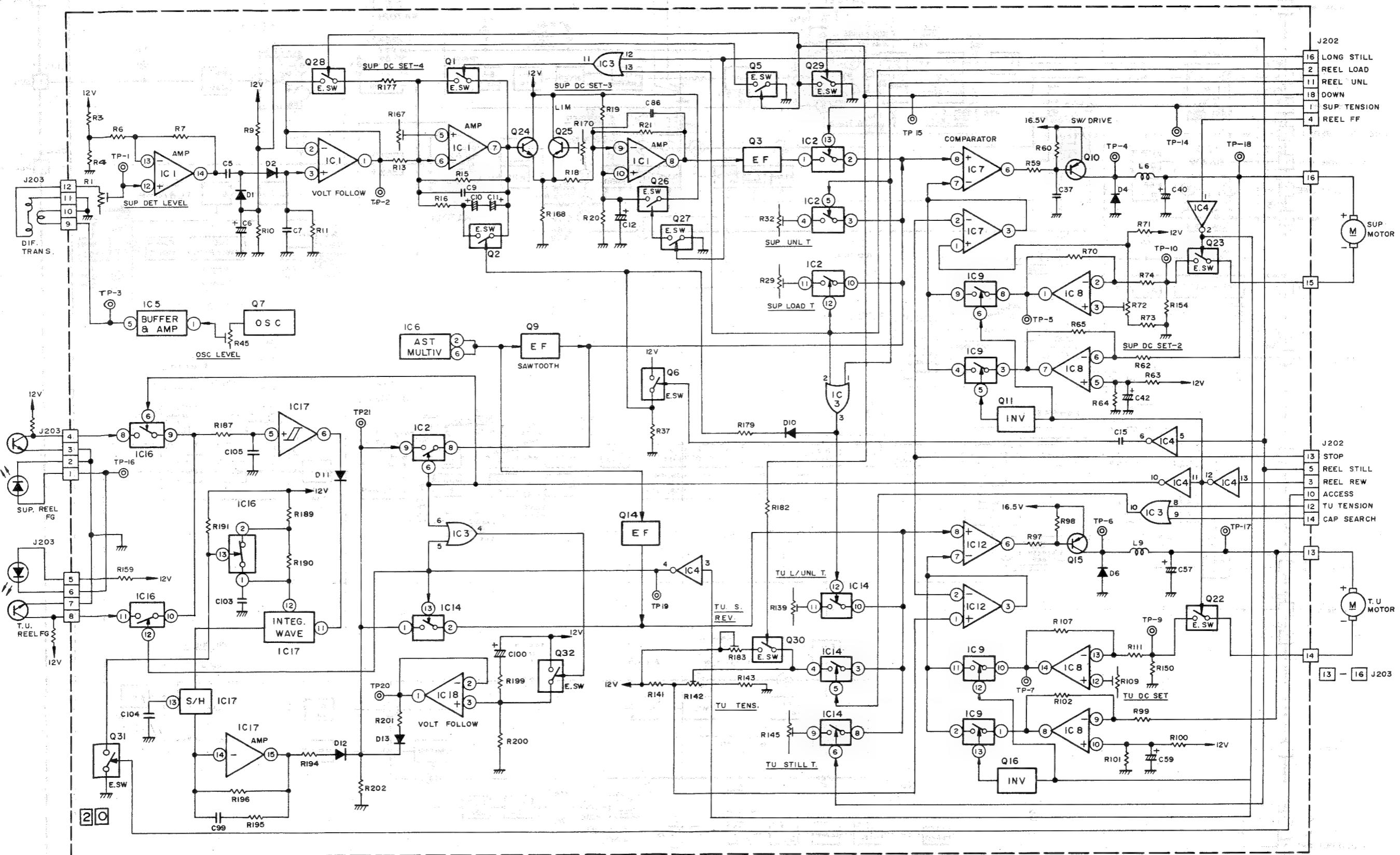
4.7 COLOR BLOCK DIAGRAM



4.8 BLOCK DIAGRAM

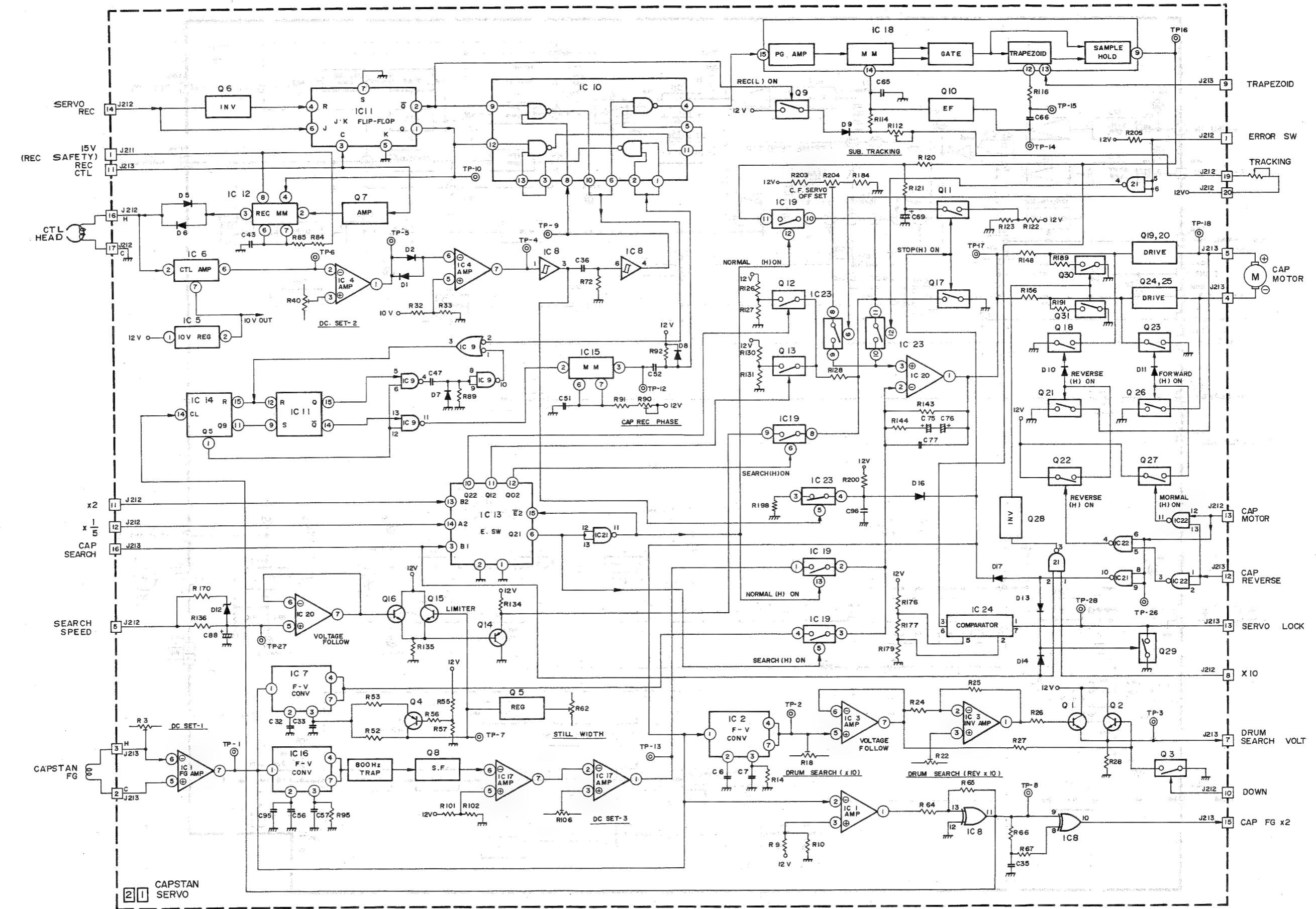


4.9 REEL SERVO BLOCK DIAGRAM

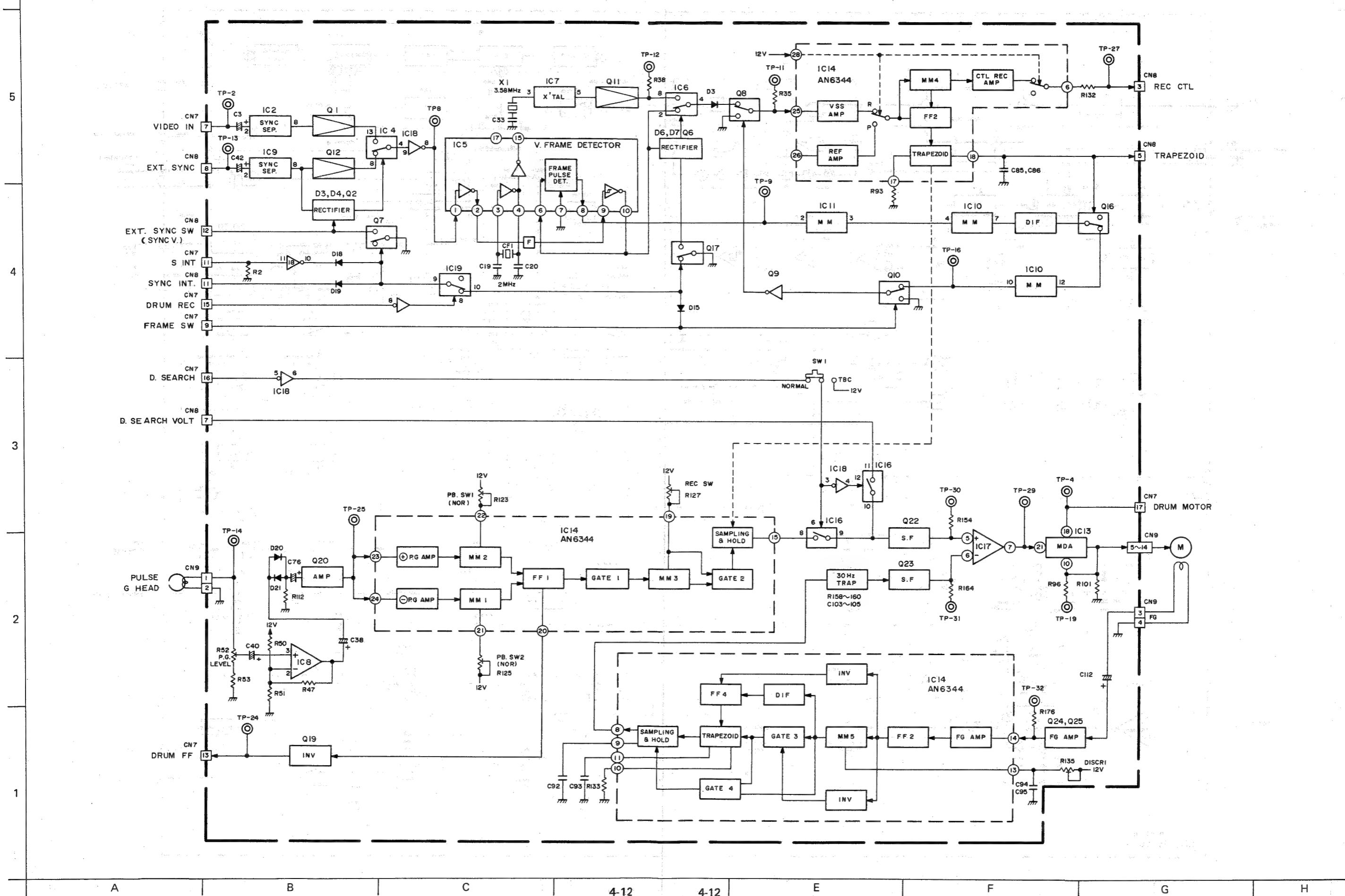


A B C 4-10 4-10 E F G H

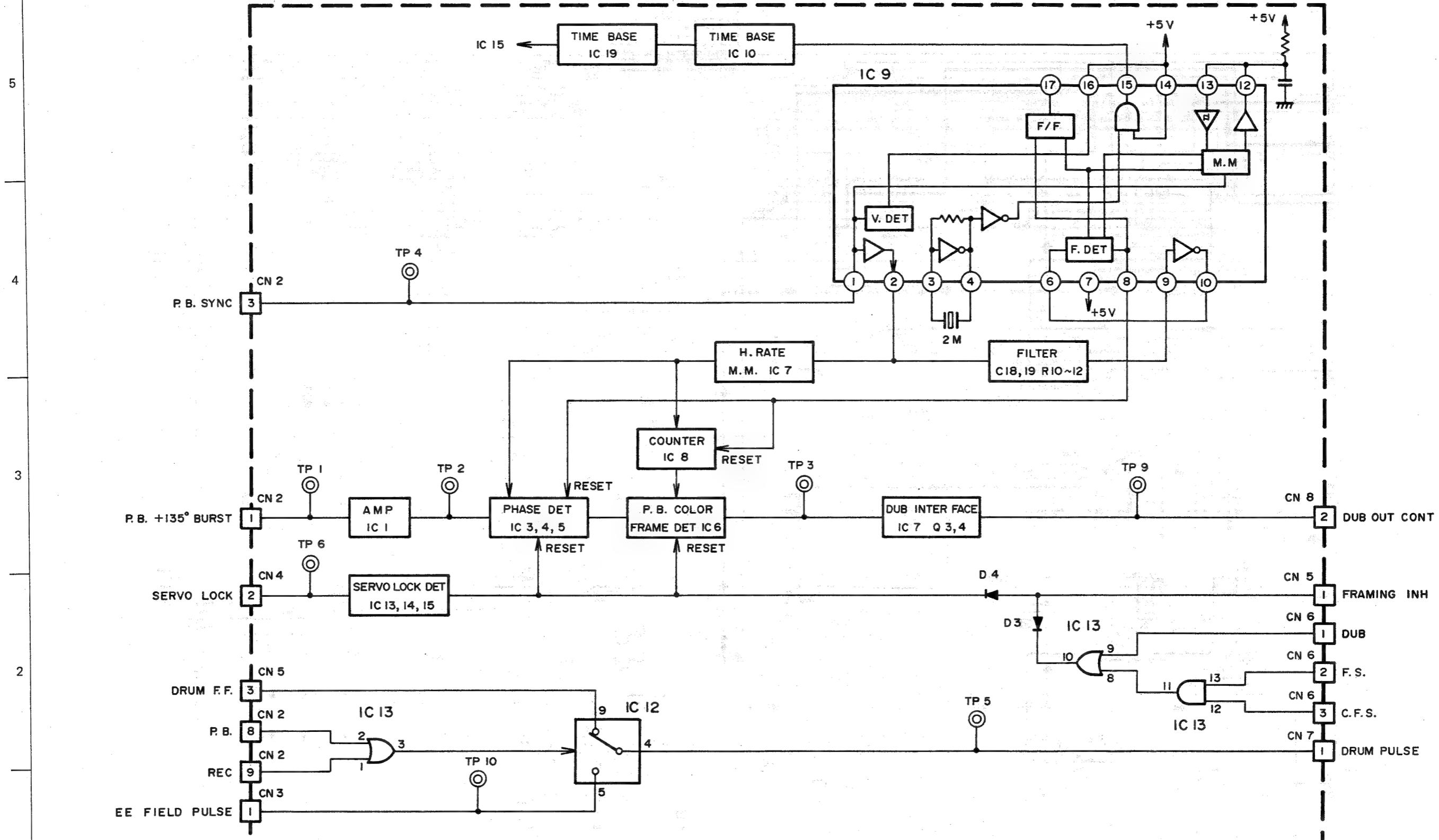
4.10 CAPSTAN BLOCK DIAGRAM



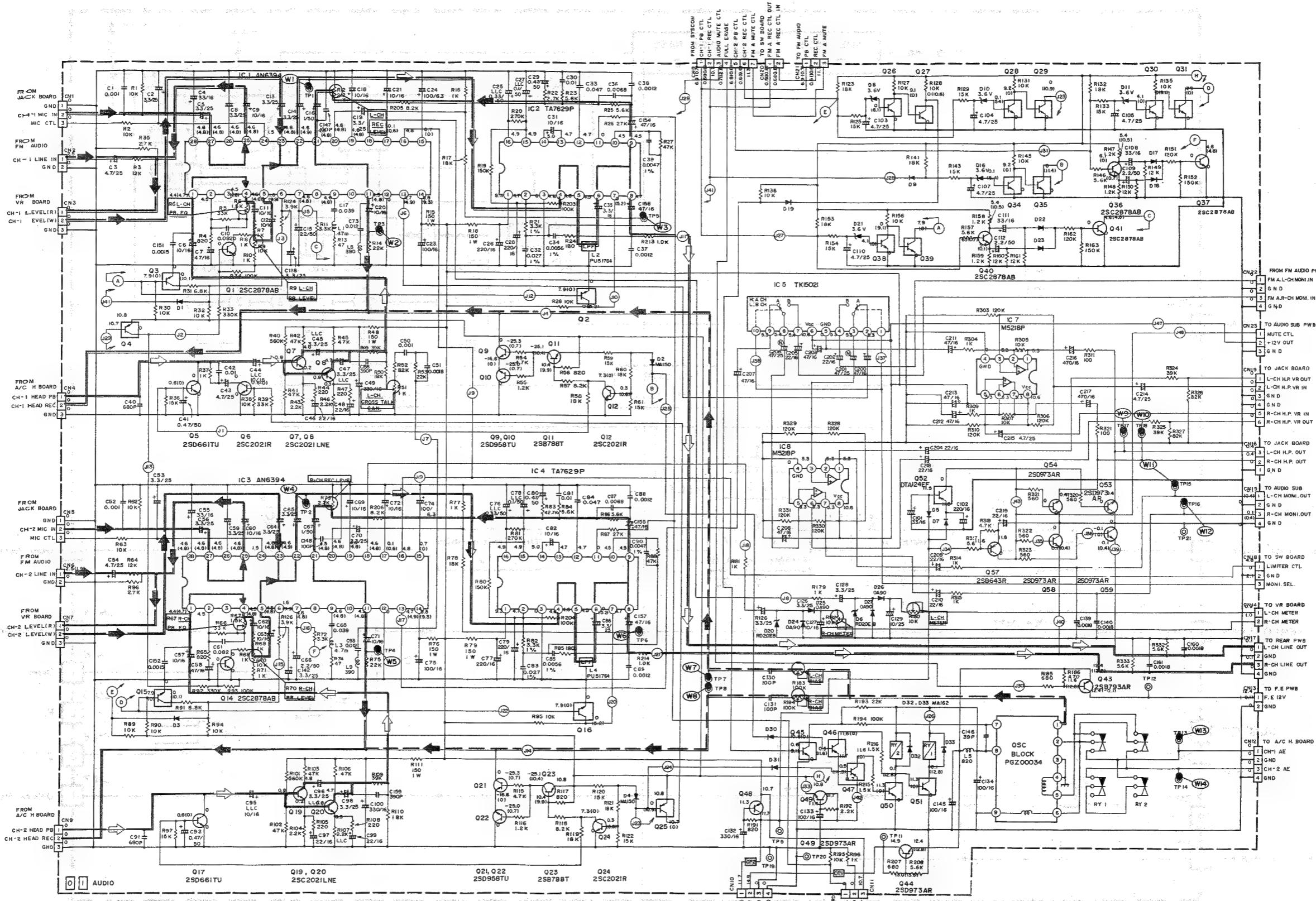
4.11 DRUM BLOCK DIAGRAM



4.12 COLOR FRAME SERVO BLOCK DIAGRAM



4.13 AUDIO SCHEMATIC DIAGRAM



NOTES: Unless otherwise specified:

- NOTES:** Unless otherwise specified,

 1. All NPN transistors are DTC144WF.
 2. All PNP transistors are DTA144WF.
 3. All diodes are 1SS133.
 4. All capacitance values are in microfarads.
 5. All inductance values are in microhenrys.

6. All resistance values are in ohms 1/8W.

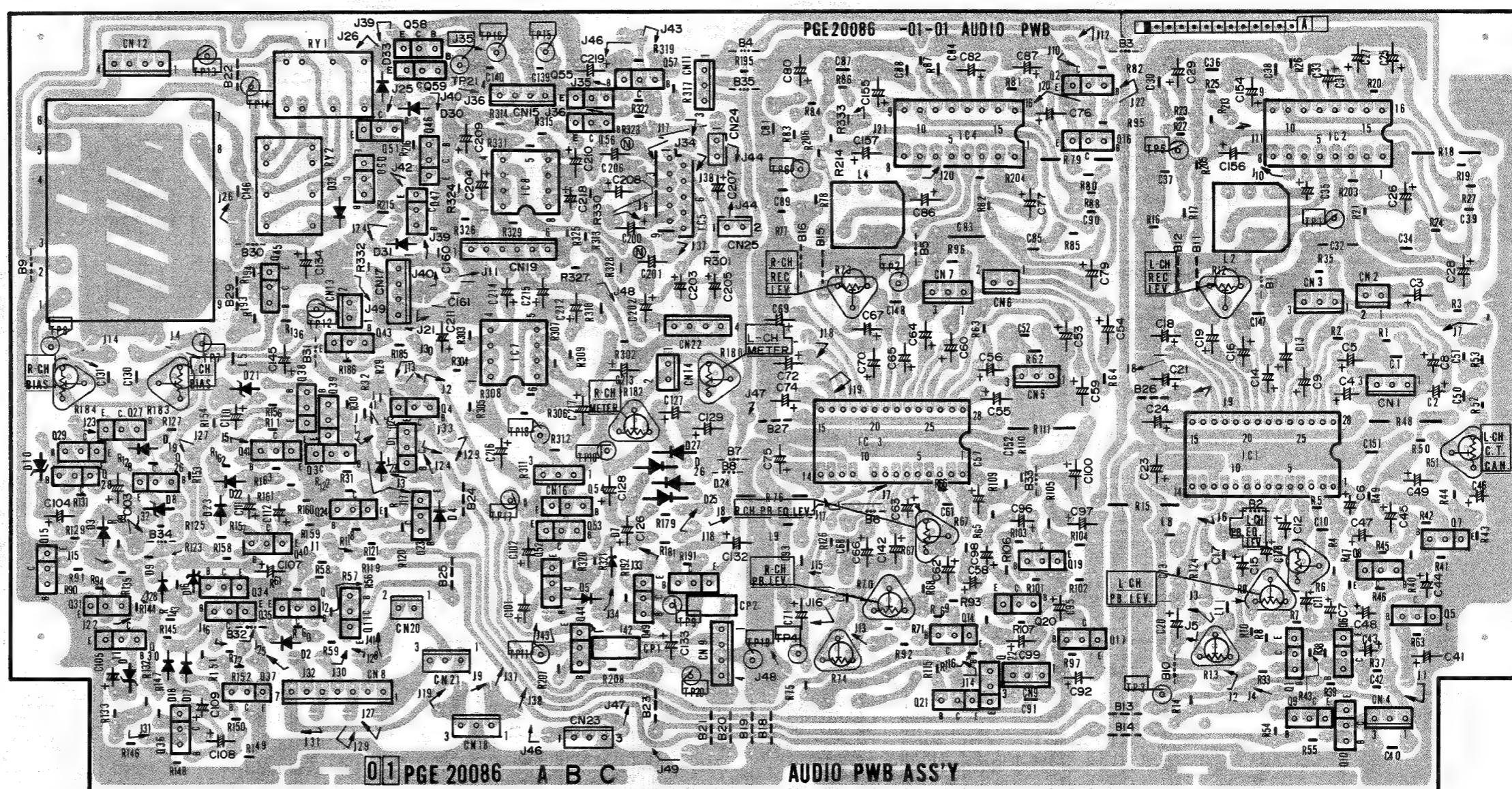
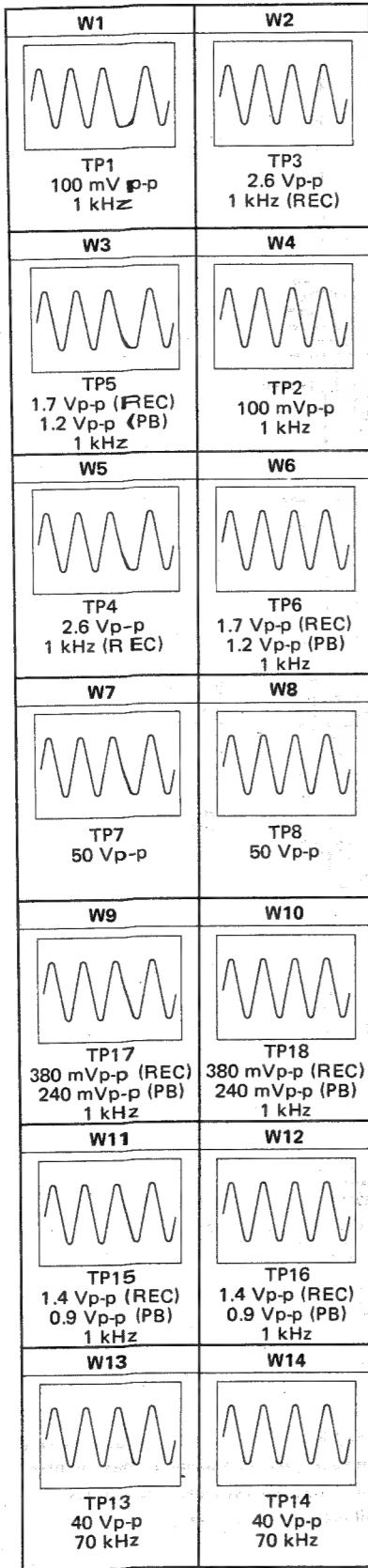
 ELECTROLYTIC
 NON POLARIZED
 MYLAR OR CERAMIC

 7. Shaded (■) parts are critical for safety. Replace only with specified part number.

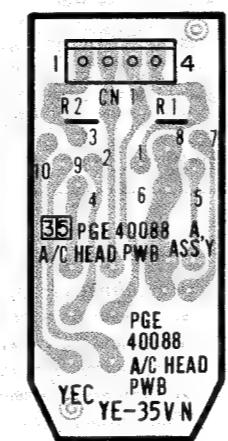
- RECORDING SIGNAL PATH
- PLAYBACK SIGNAL PATH
- REC PLAY SIGNAL PATH

4.14 AUDIO, AC HEAD, FE HEAD & AUDIO SUB CIRCUIT BOARDS

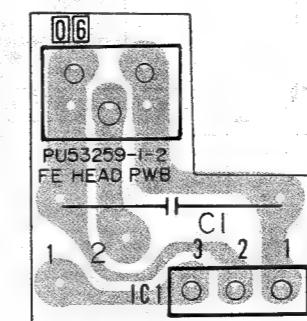
— Main waveforms of
AUDIO circuit —



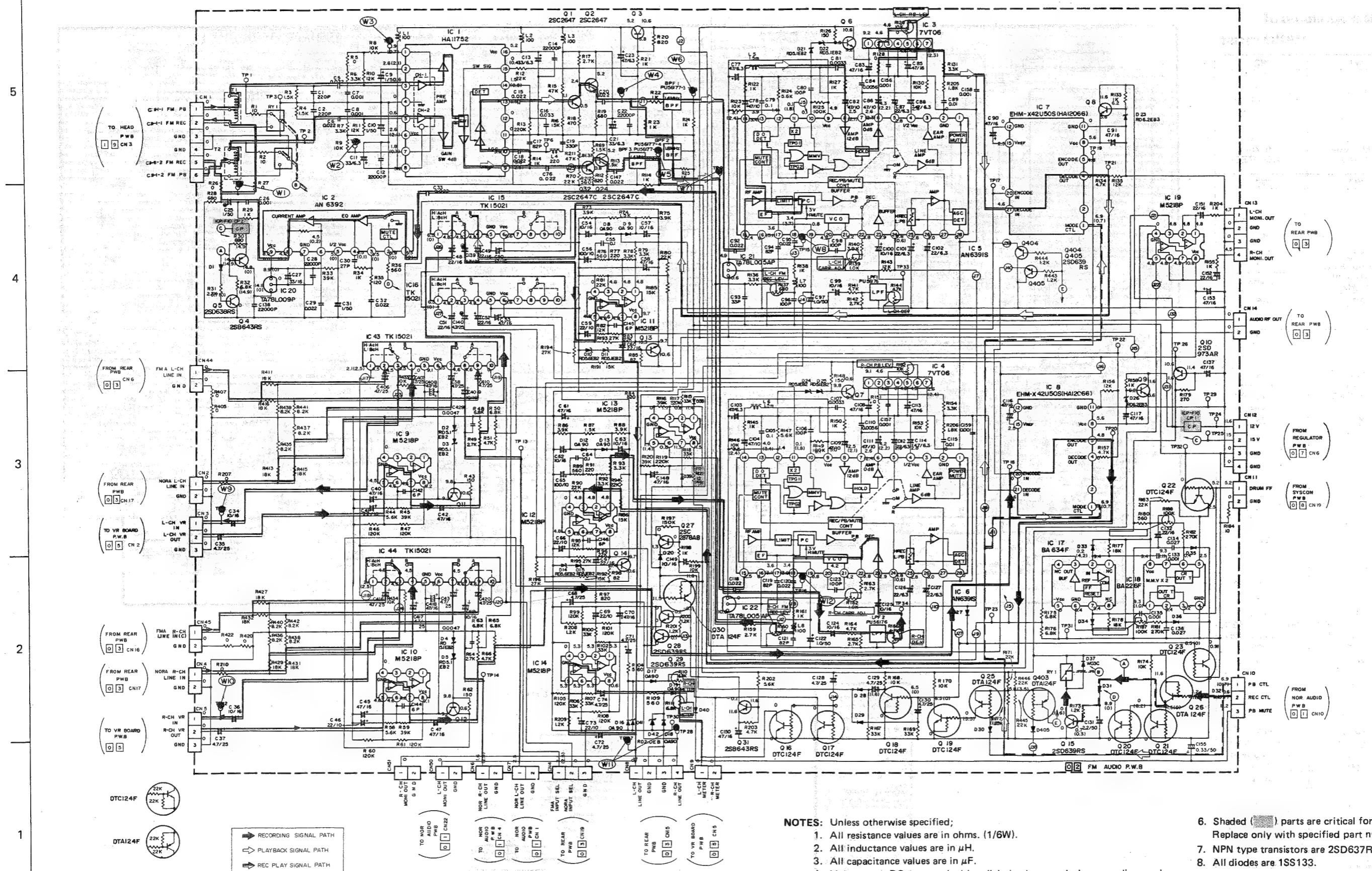
— AC HEAD —



— FE HEAD —



4.15 FM AUDIO SCHEMATIC DIAGRAM



A

B

C

4-16

4-16

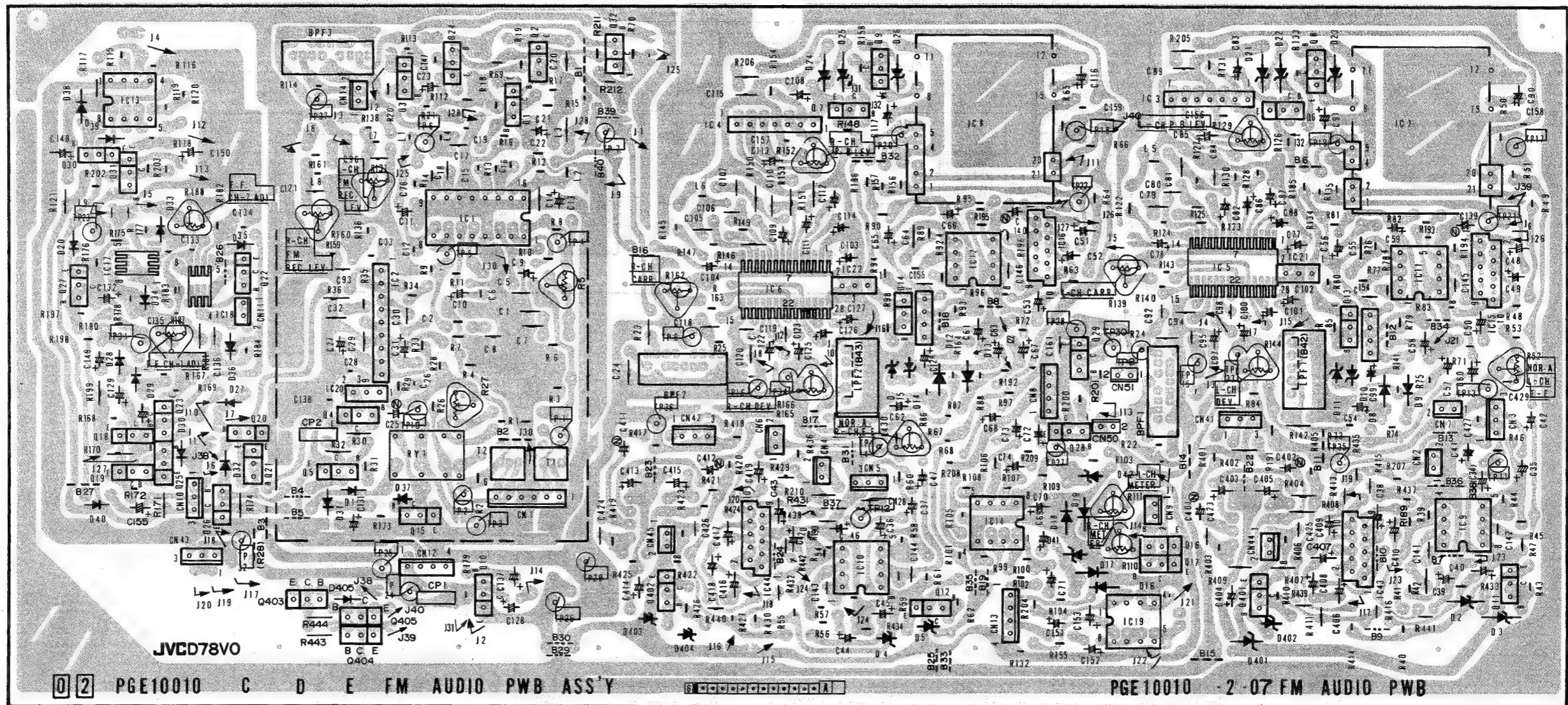
E

F

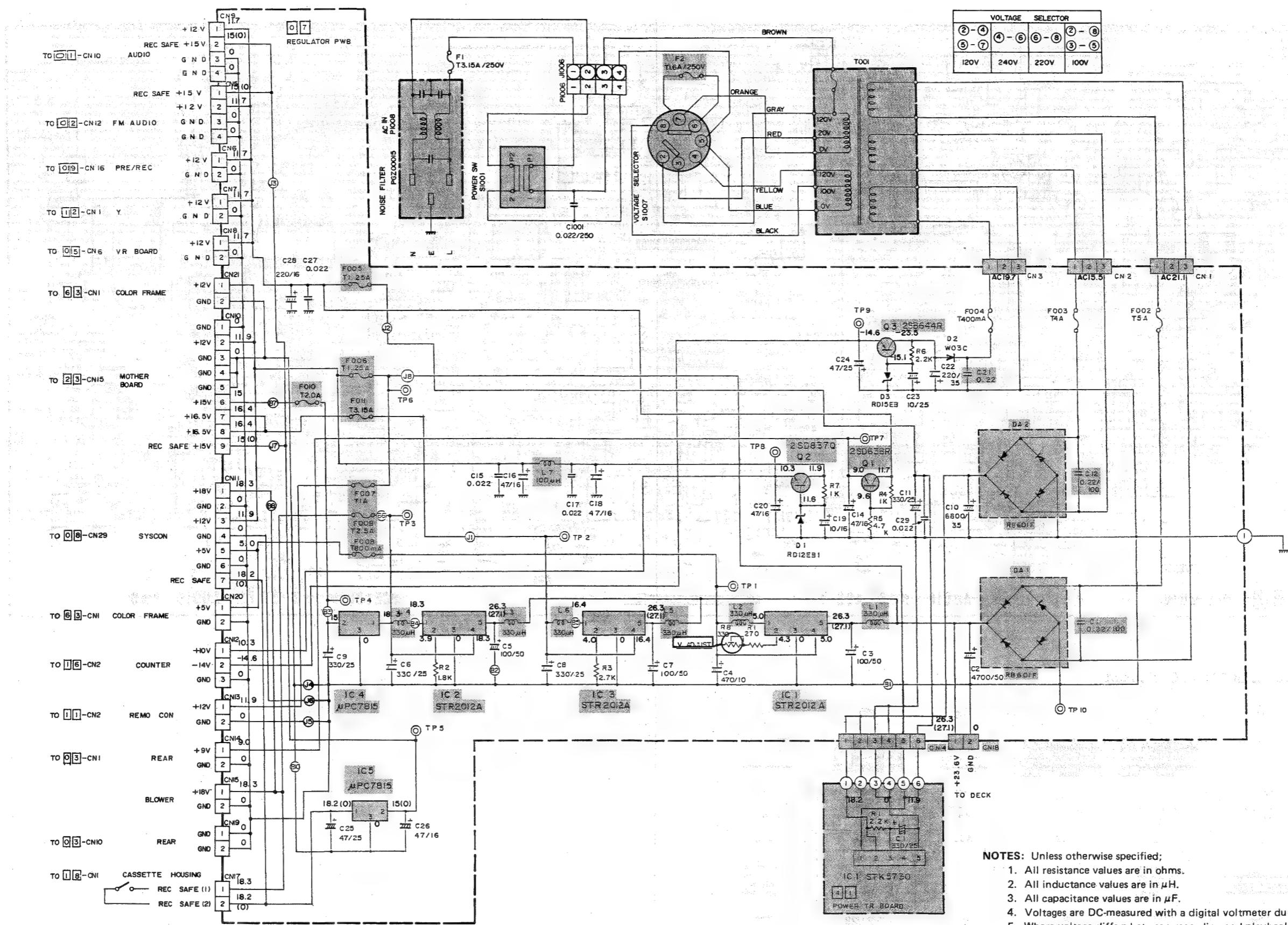
G

H

4.16 FM AUDIO CIRCUIT BOARD

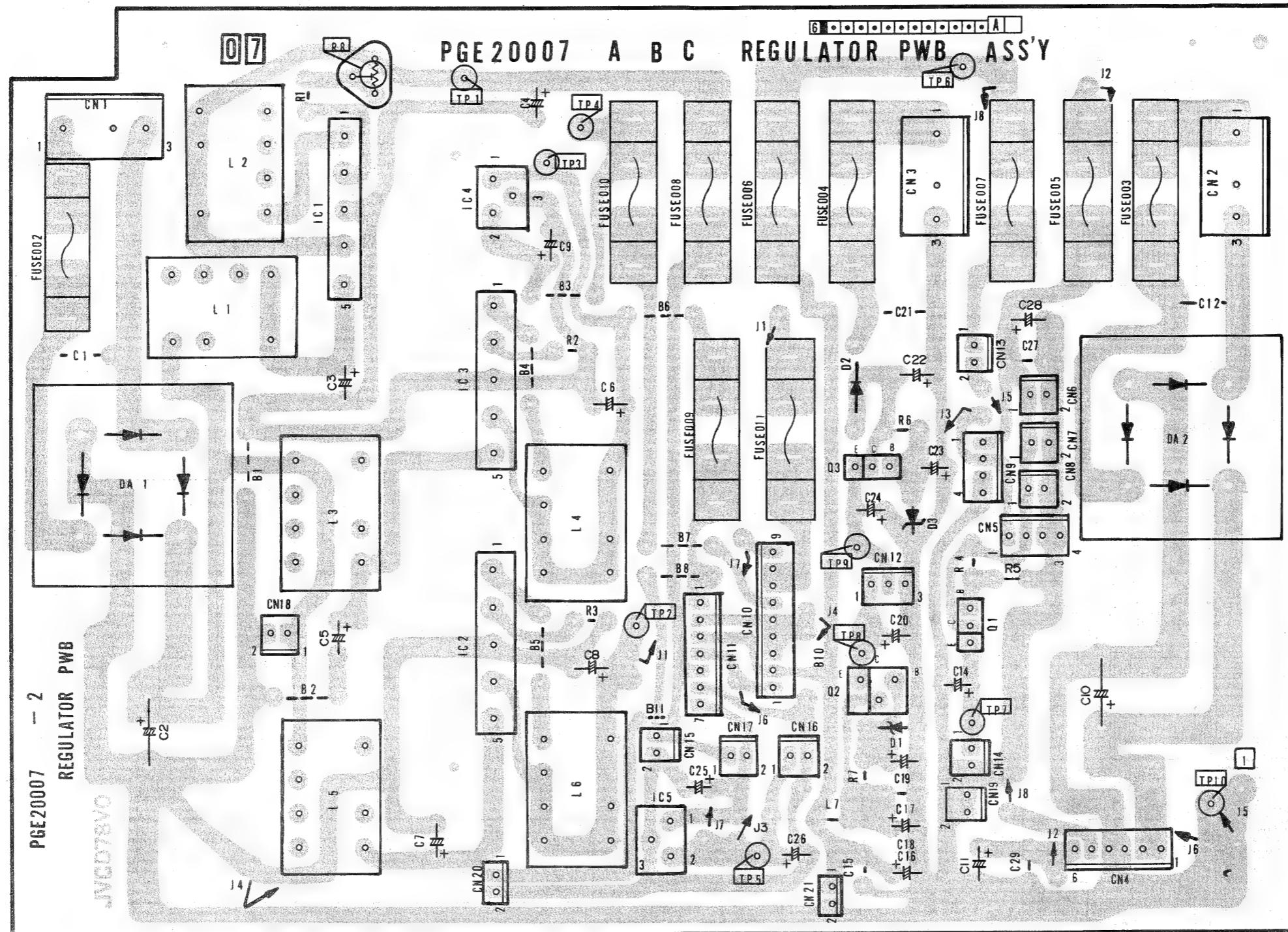


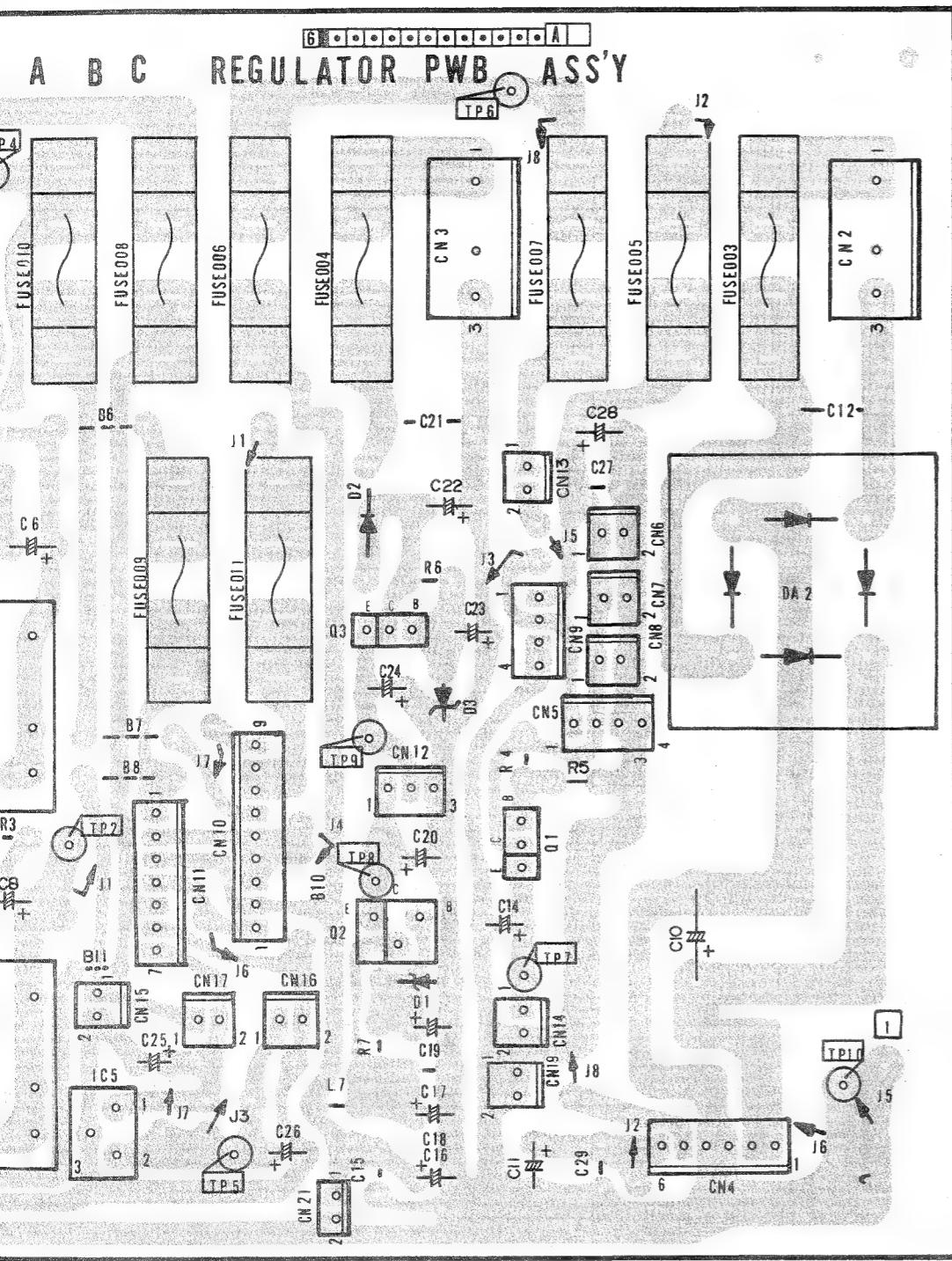
4.17 REGULATOR SCHEMATIC DIAGRAM



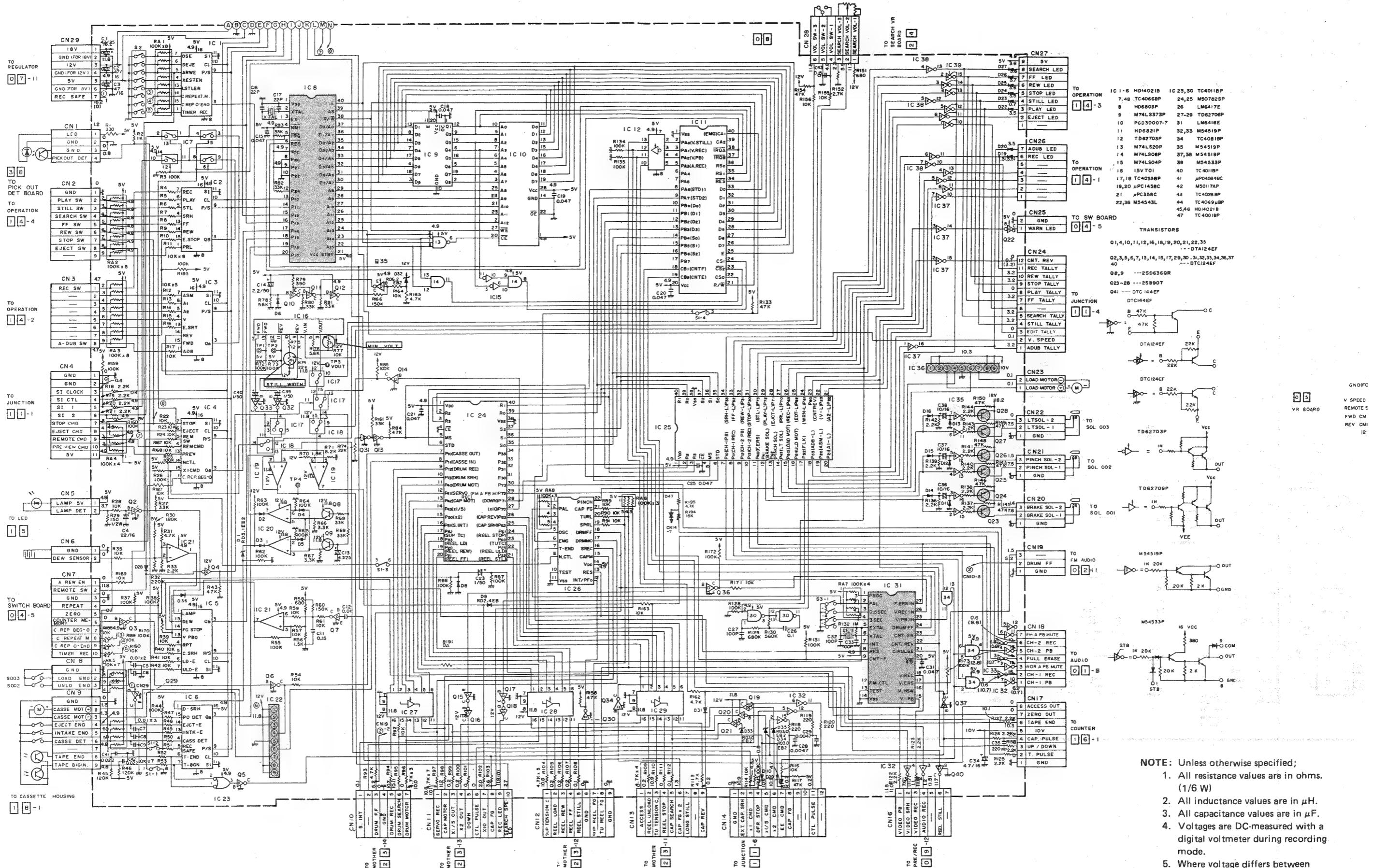
NOTES: Unless otherwise specified;

1. All resistance values are in ohms.
2. All inductance values are in μ H.
3. All capacitance values are in μ F.
4. Voltages are DC-measured with a digital voltmeter during recording mode.
5. Where voltage differs between recording and playback, the voltage during playback is shown in parentheses.
6. Shaded (■) parts are critical for safety. Replace only with specified part numbers.



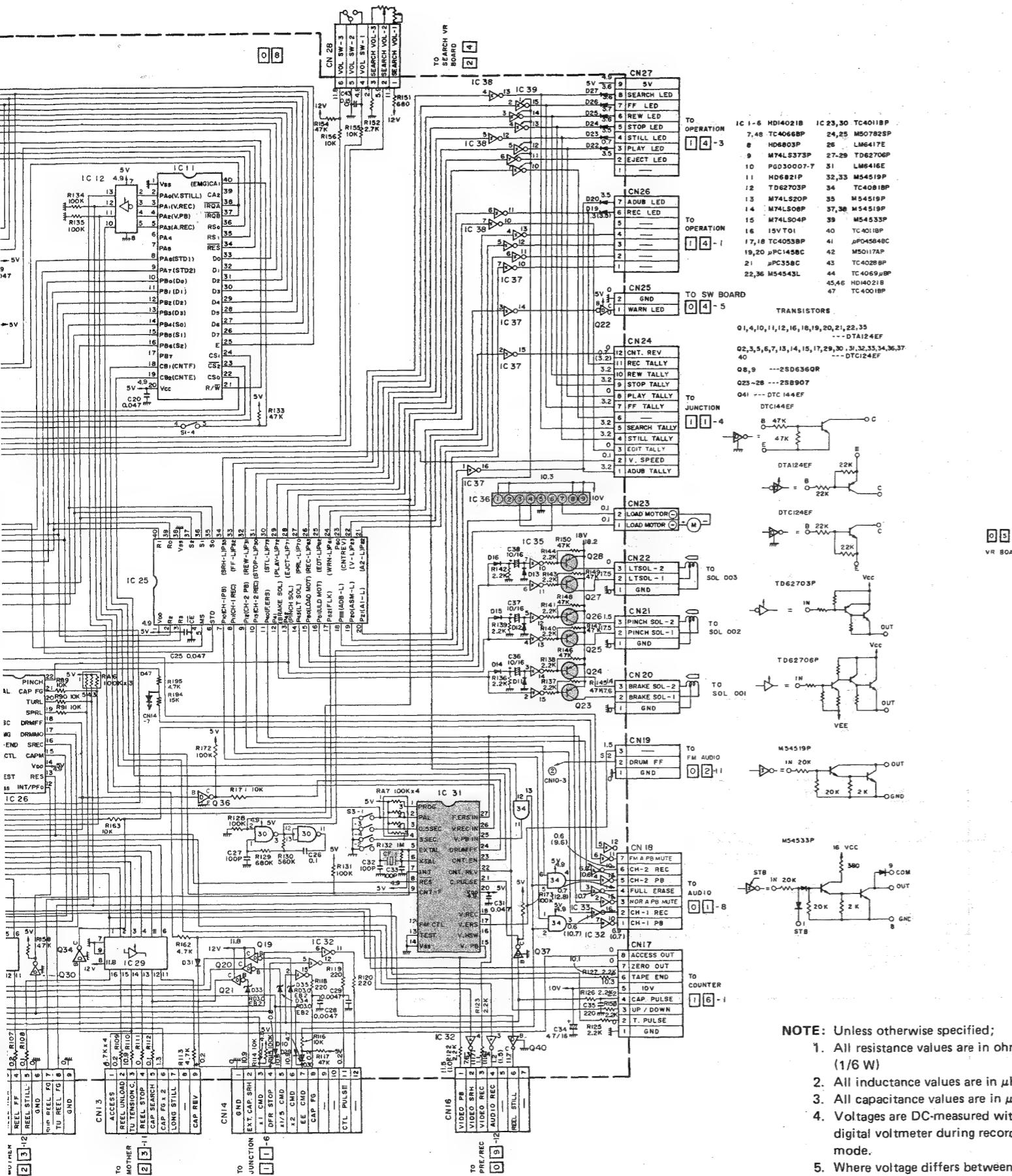


4.19 SYSTEM CONTROL SCHEMATIC DIAGRAM



NOTE: Unless otherwise specified;

1. All resistance values are in ohms.
(1/6 W)
2. All inductance values are in μ H.
3. All capacitance values are in μ F.
4. Voltages are DC-measured with a digital voltmeter during recording mode.
5. Where voltage differs between recording and playback, the voltage during playback is shown in parentheses.



D

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F

G

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W

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A

B

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E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

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V

W

X

Y

Z

A

B

C

D

E

F

G

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J

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S

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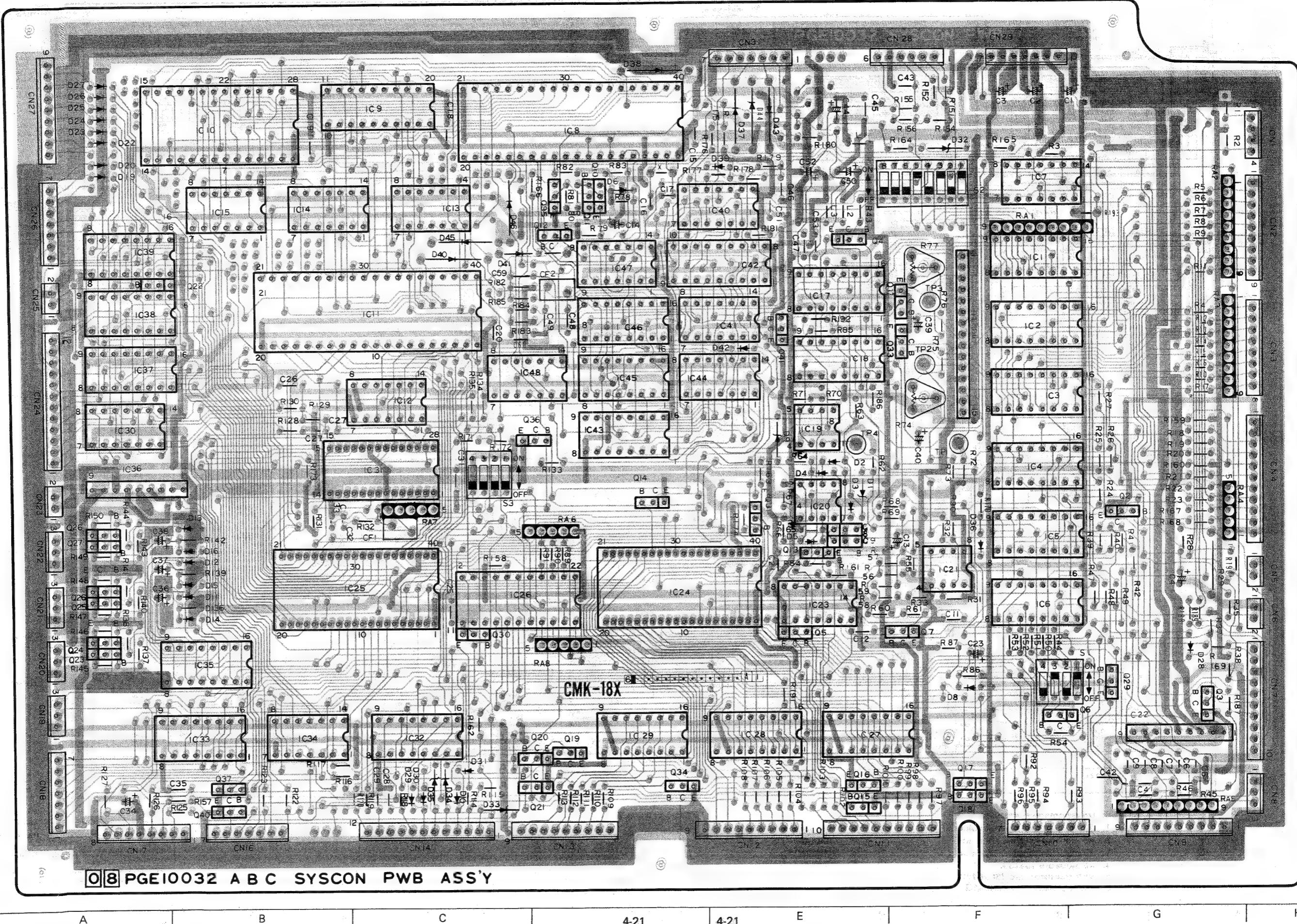
E

F

G

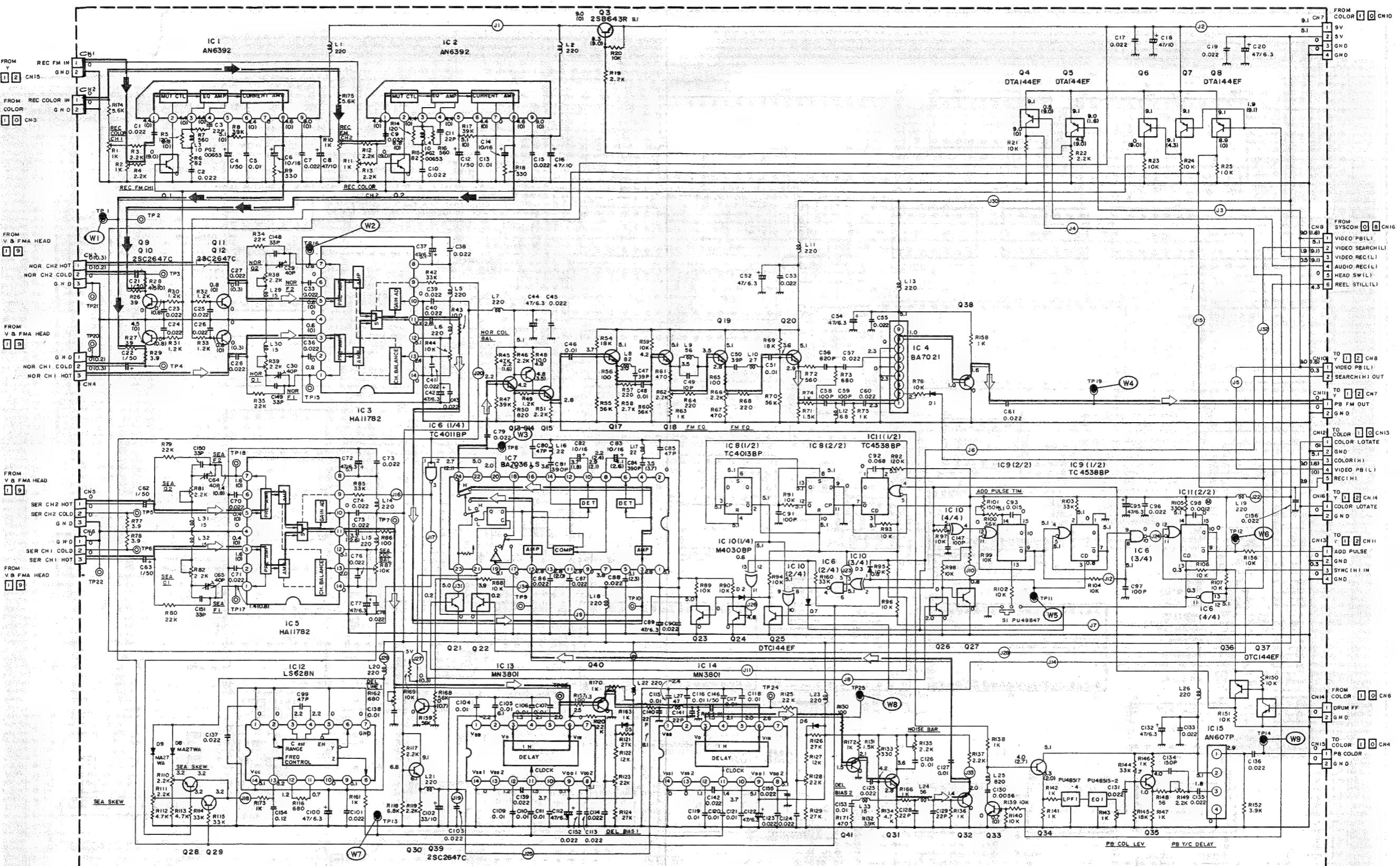
H

4.20 SYSTEM CONTROL CIRCUIT BOARD



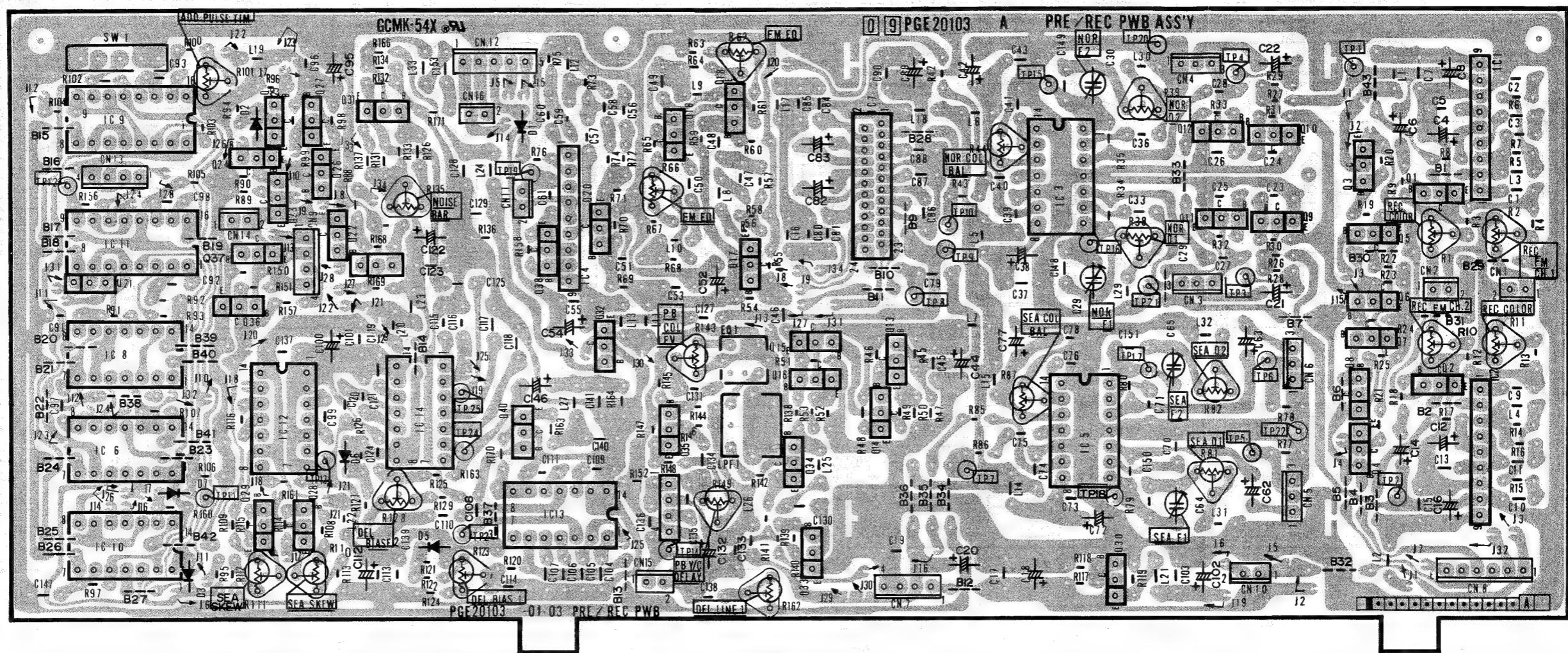
08 PGE10032 ABC SYSCON PWB ASS'Y

4.21 PRE/REC SCHEMATIC DIAGRAM

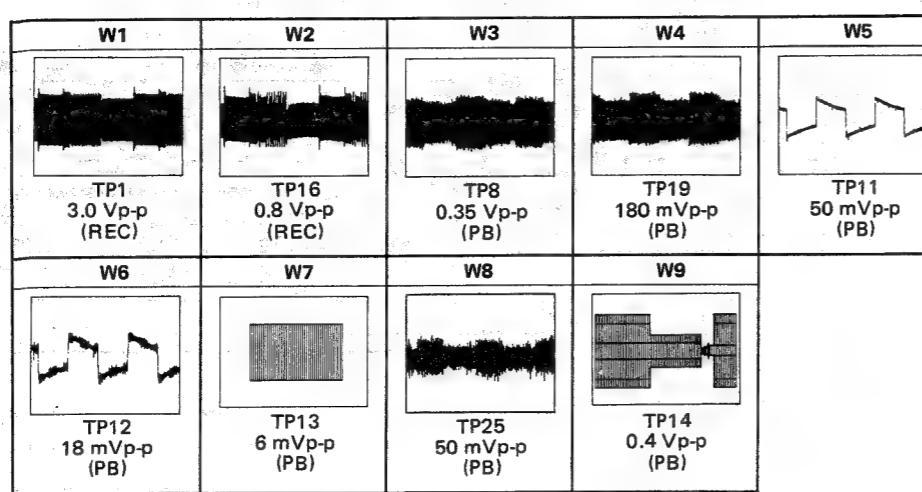


→ RECORDING SIGNAL PATH
 → PLAYBACK SIGNAL PATH
 → REC PLAY SIGNAL PATH

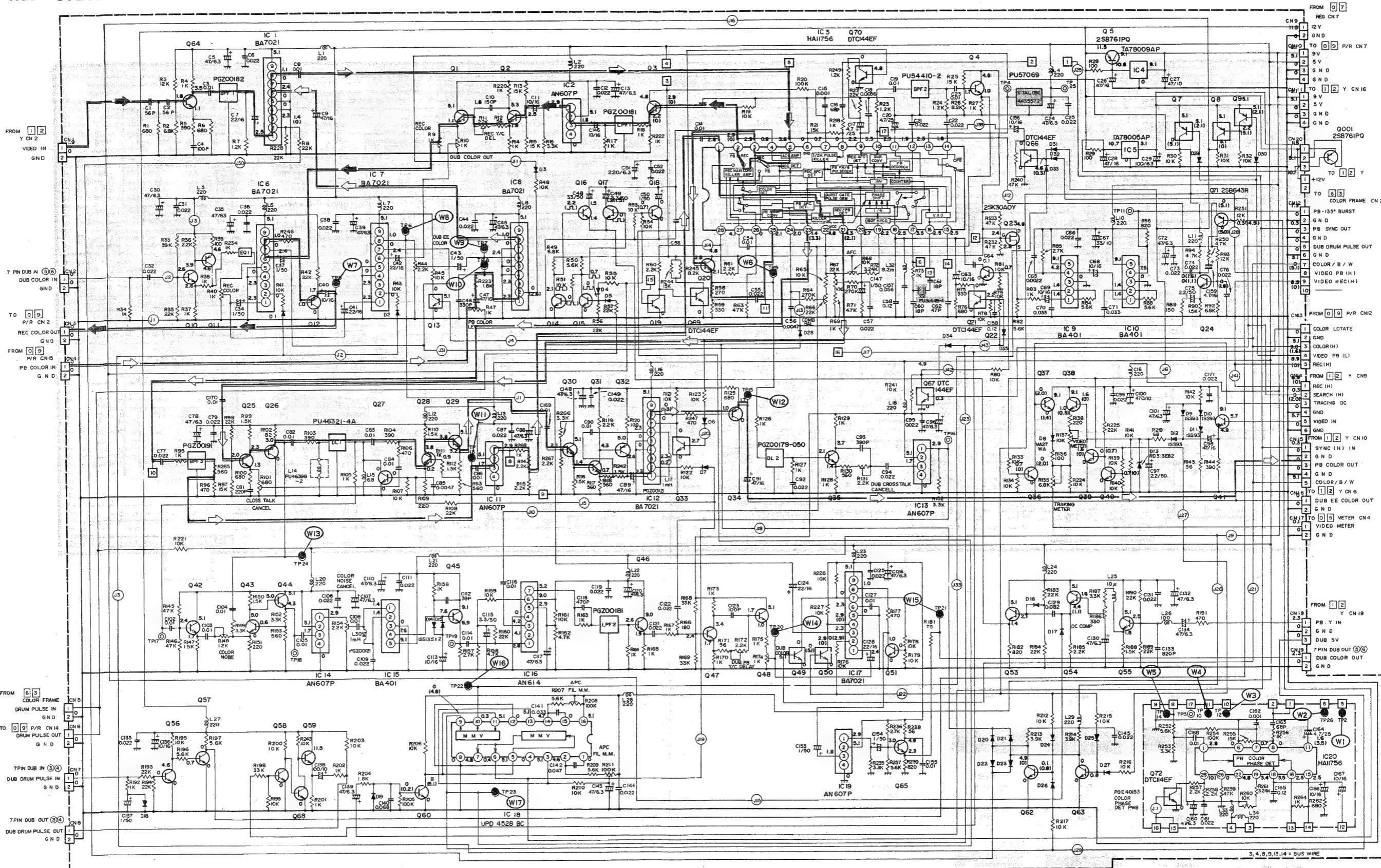
4.22 PRE/REC CIRCUIT BOARD



— Main waveforms of PRE/REC circuit —



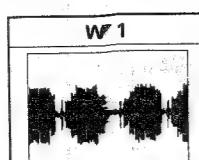
4.23 COLOR SCHEMATIC DIAGRAM



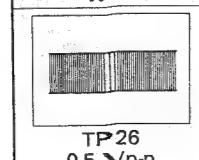
→ RECORDING SIGNAL PATH
→ PLAYBACK SIGNAL PATH
→ REC PLAY SIGNAL PATH

4.24 COLOR CIRCUIT BOARD

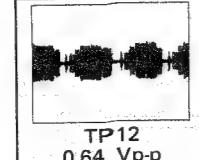
- Main waveforms of
COLOR & COLOR
PHASE DET. circuits -



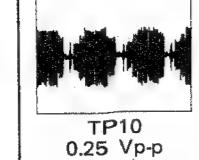
TP2
0.15 Vp-p
(PB)



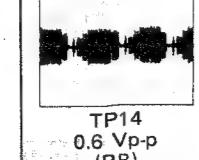
TP26
0.5 Vp-p
4.424 MHz
(PB)



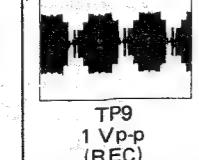
TP12
0.64 Vp-p
(PB)



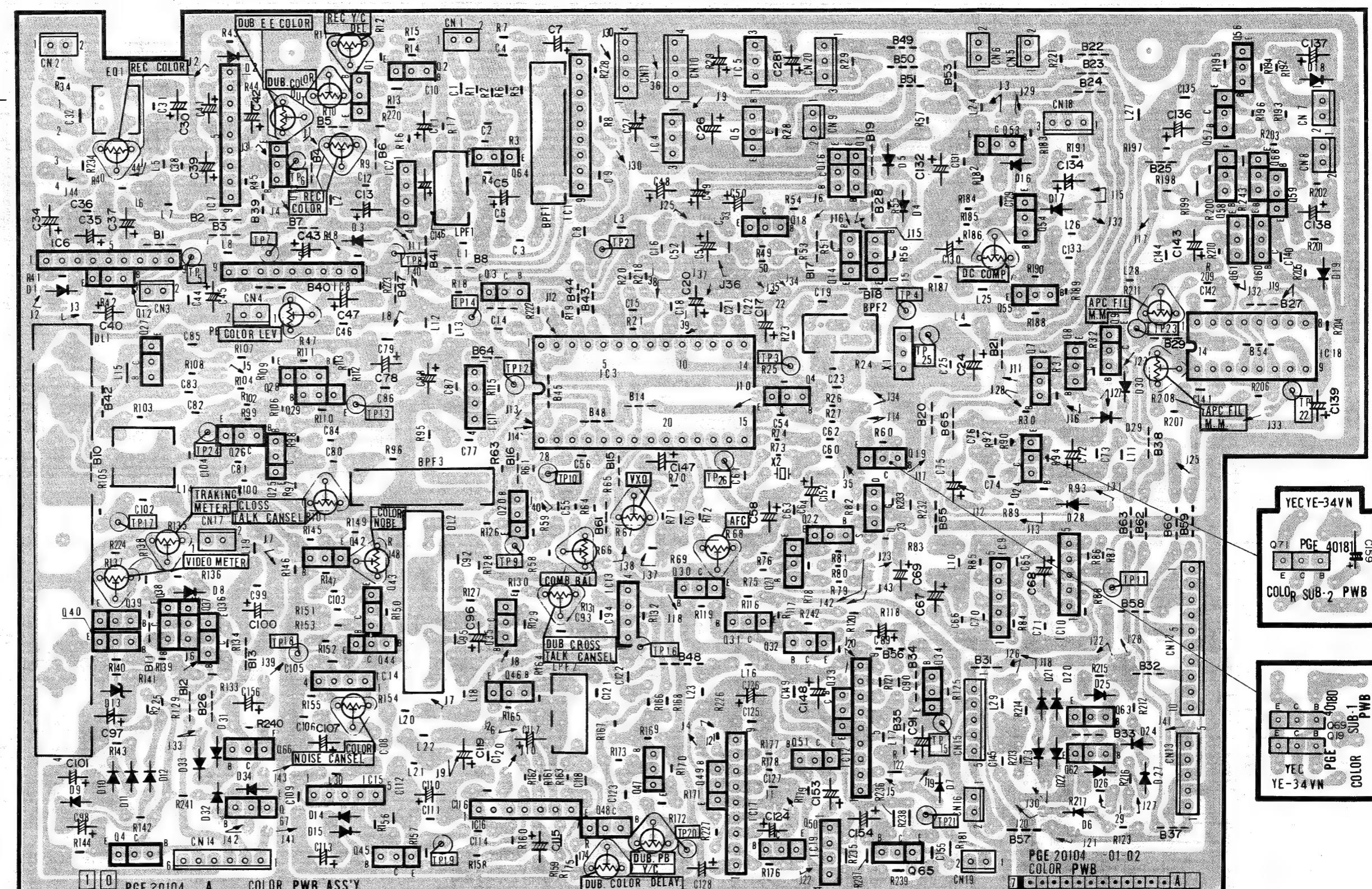
TP10
0.25 Vp-p
(PB)



TP14
0.6 Vp-p
(PB)



TP9
1 Vp-p
(REC)



W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17
TP9 0.48 Vp-p (REC)	TP5 0.17 Vp-p (REC)	TP6 0.18 Vp-p (REC)	TP7 0.15 Vp-p (REC)	TP8 0.2 Vp-p (PB)	TP13 72 mVp-p (PB)	TP15 1.3 Vp-p (PB)	TP24 1 Vp-p (PB)	TP20 160 mVp-p	TP21 1.2 Vp-p	TP22 6.7 Vp-p	TP23 5 Vp-p (PB)

A

B

C

4-25

4-25

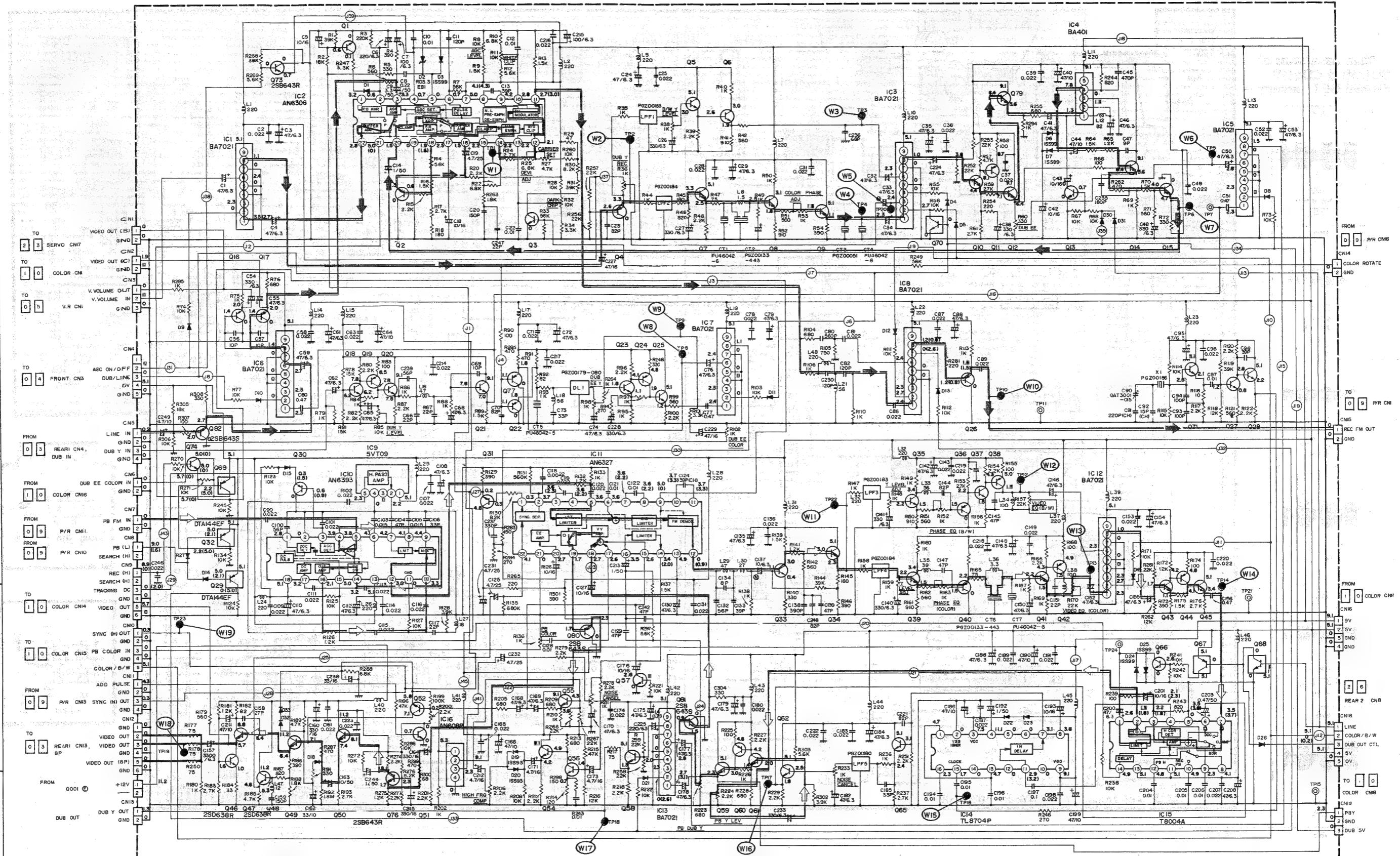
E

F

G

H

4.25 Y SCHEMATIC DIAGRAM



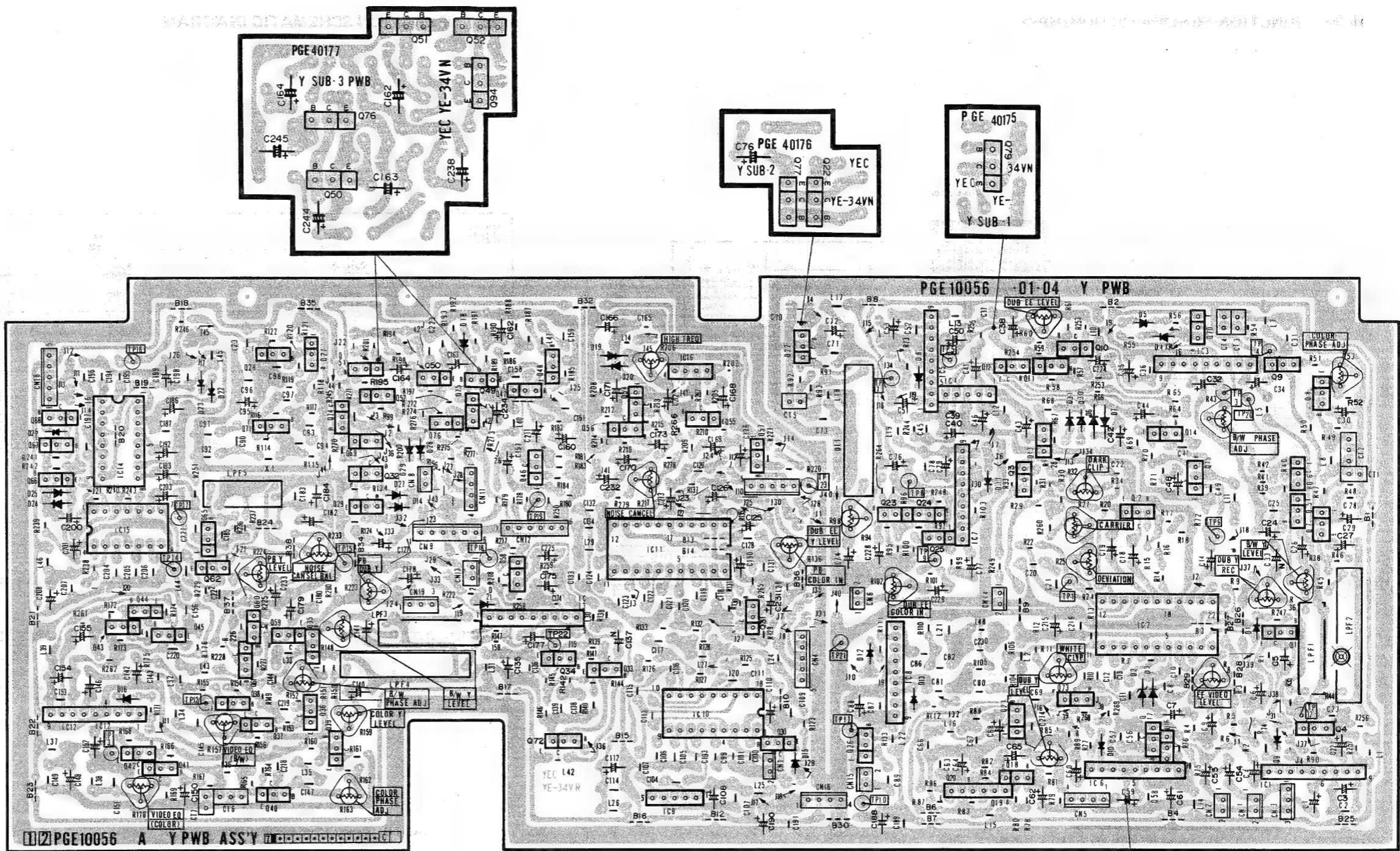
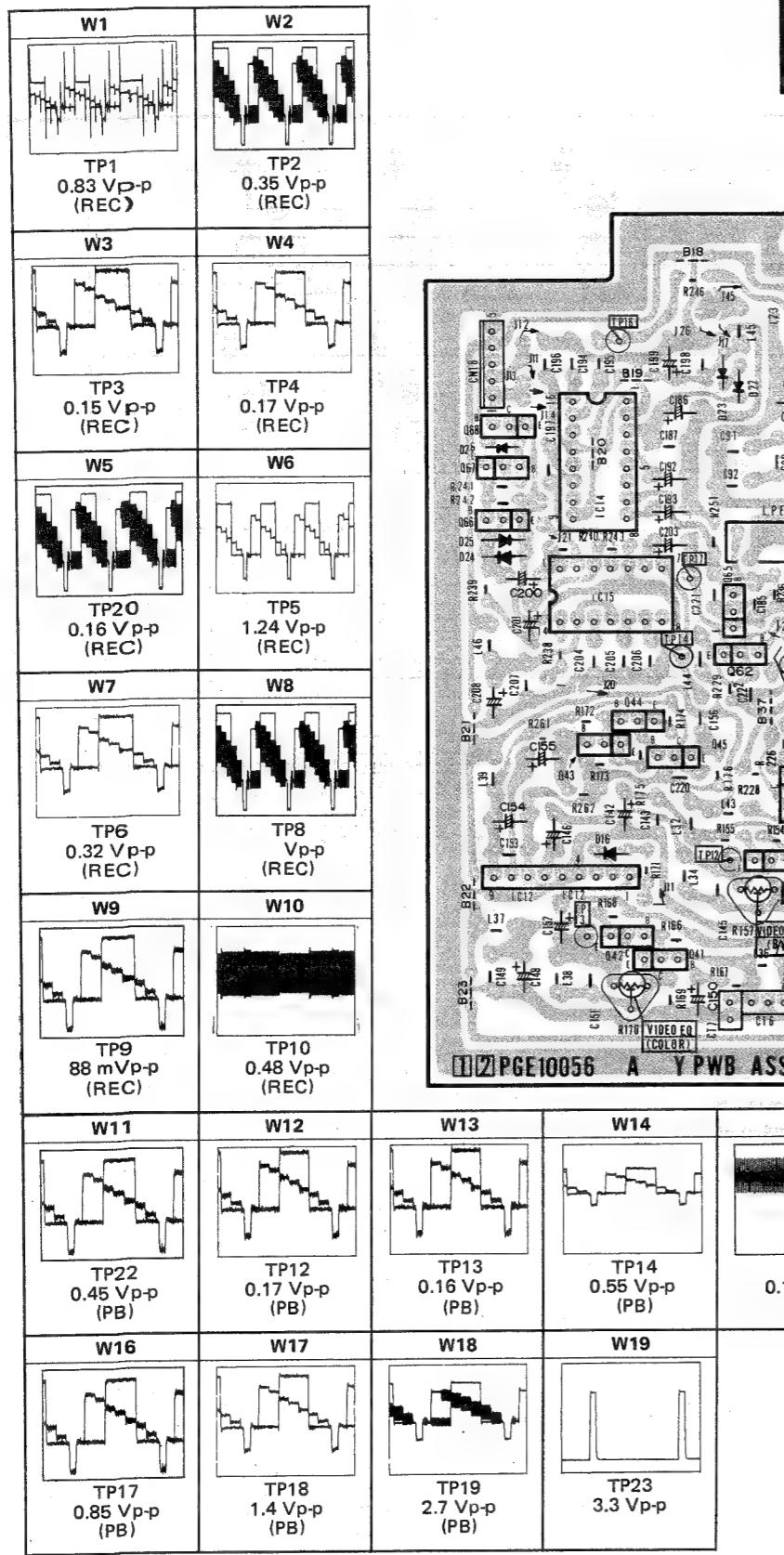
NOTES: Unless otherwise specified;

1. All resistance values are in ohms. (1/6W).
2. All inductance values are in μ H.
3. All capacitance values are in μ F.
4. All diode are 1SS133.
5. NPN transistors are 2SC2647C.
6. PNP transistors are 2SB641.
7. NPN D. transistors are DTC114EF.
8. PNP D. transistors are DTA114EF.
9. Electrolytic.
10. Mylar or ceramic.

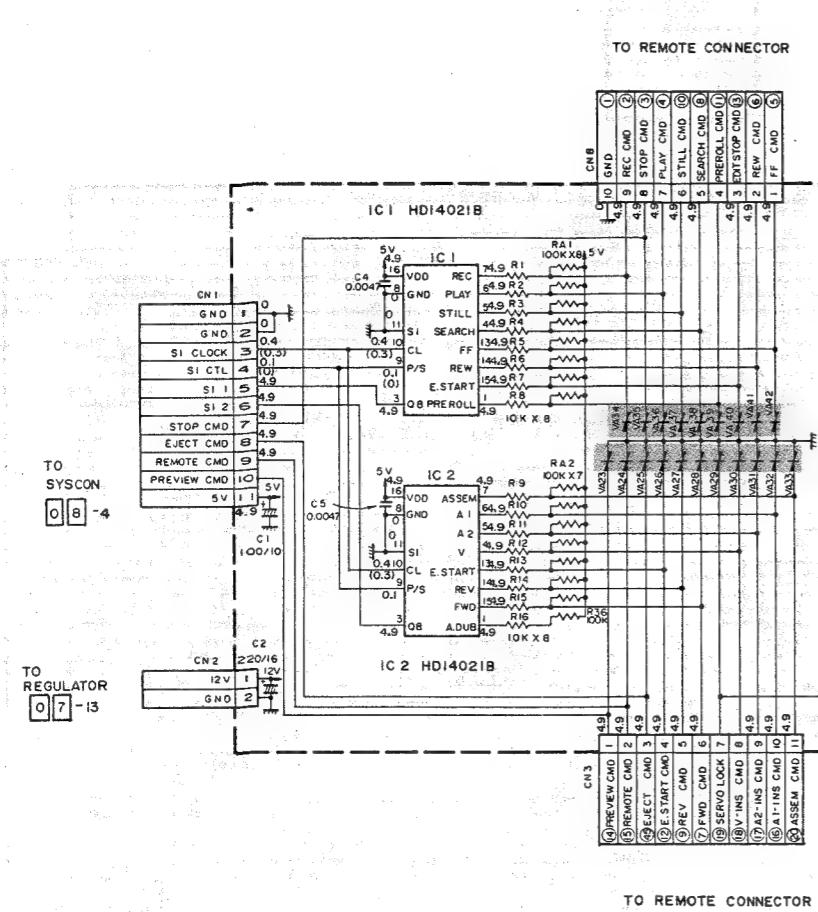
- RECORDING SIGNAL PATH
- PLAYBACK SIGNAL PATH
- REPLAY SIGNAL PATH

4.26 Y CIRCUIT BOARD

– Main waveforms of Y circuit –



4.27 JUNCTION SCHEMATIC DIAGRAM



NOTES: Unless otherwise specified.

1. All resistance values are in ohms. (1/6 W).
2. All inductance values are in μ H.
3. All capacitance values are in μ F.
4. Voltages are DC-measured with a digital voltmeter during recording mode.
5. Where voltage differs between recording and playback, the voltage during playback is shown in parentheses.
6. All varistors are PU49624-2.
7. Shaded (■) parts are critical for safety. Replace only with specified part numbers.

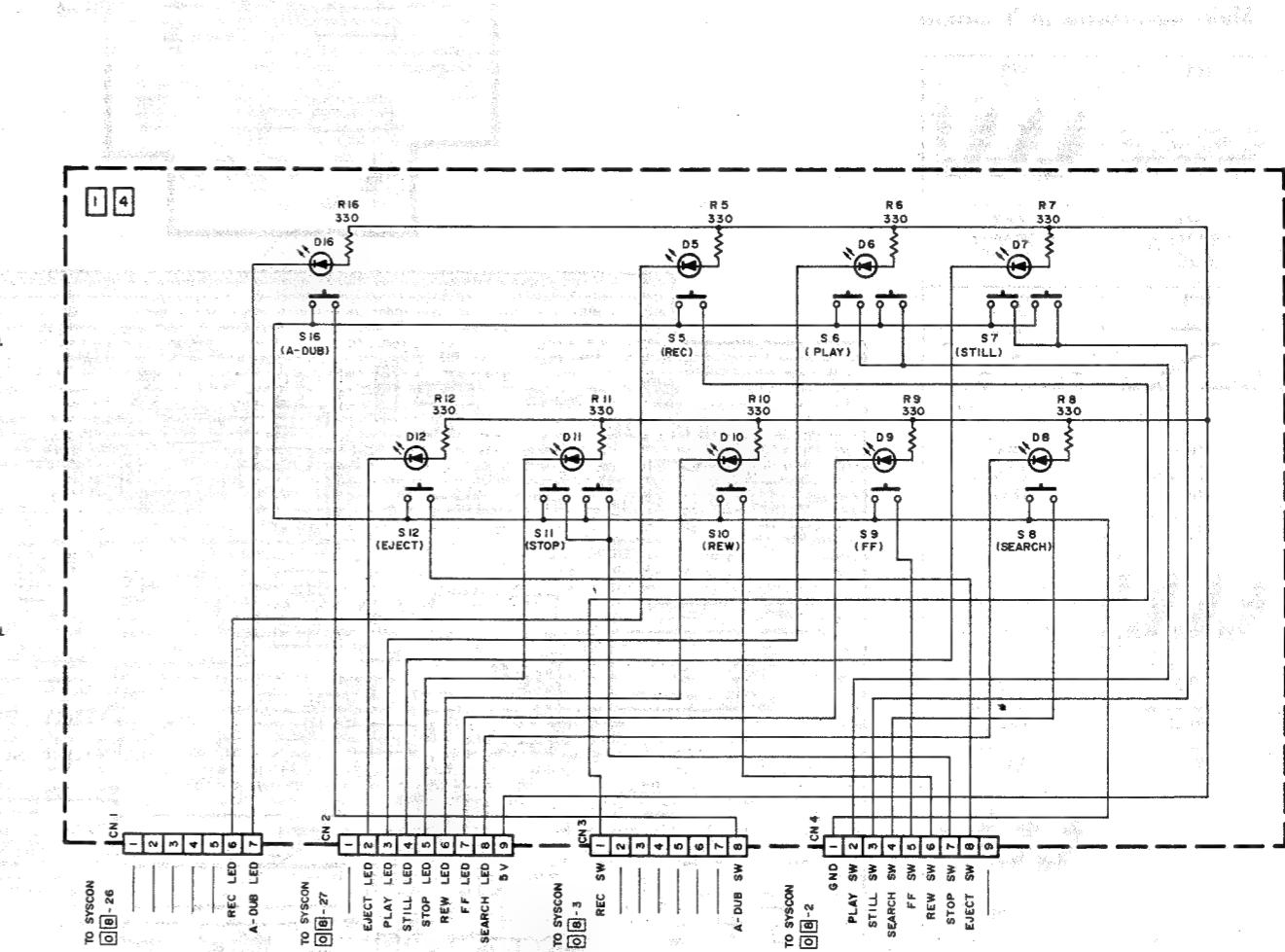
A

B

C

4-28

4.28 OPERATION SCHEMATIC DIAGRAM



NOTES: Unless otherwise specified.

1. All resistance values are in ohms. (1/8 W).
2. All inductance values are in μ H.
3. All capacitance values are in μ F.

E

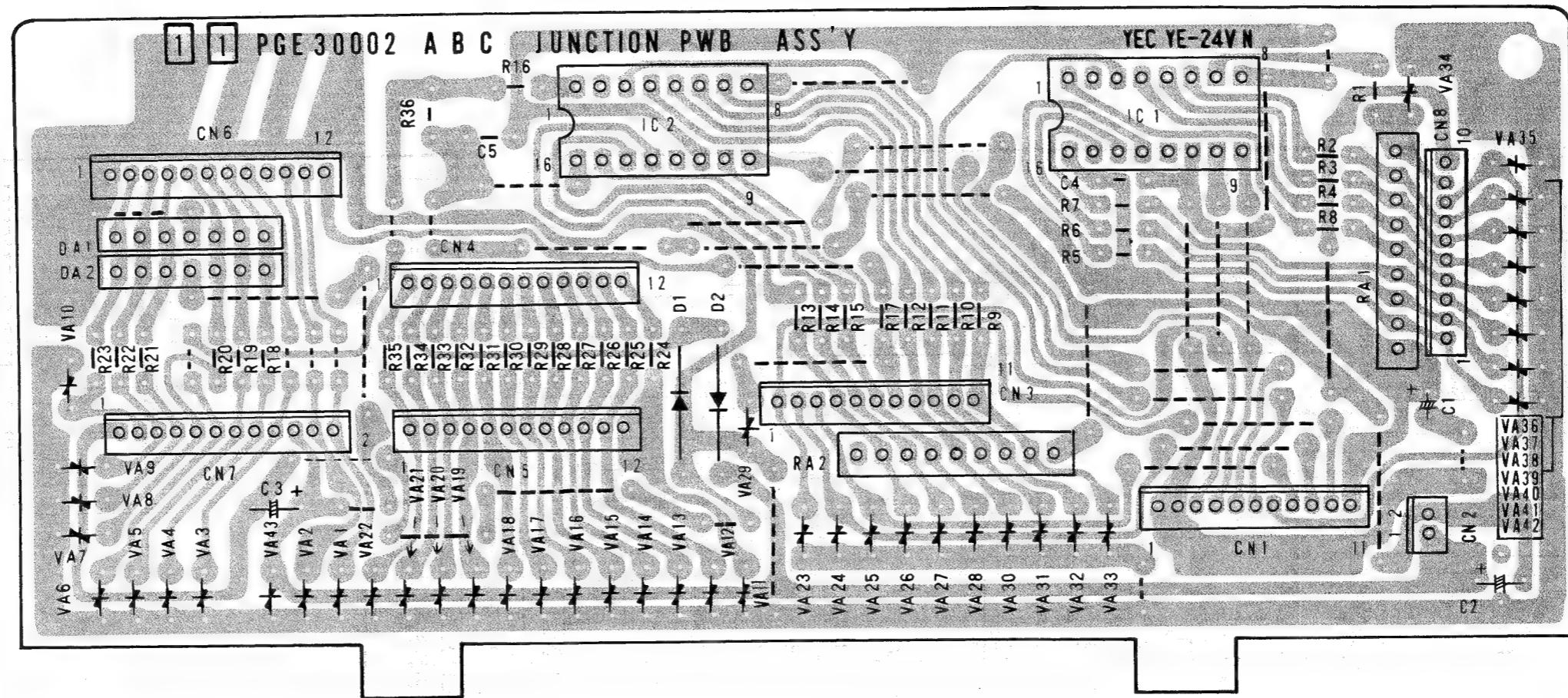
F

G

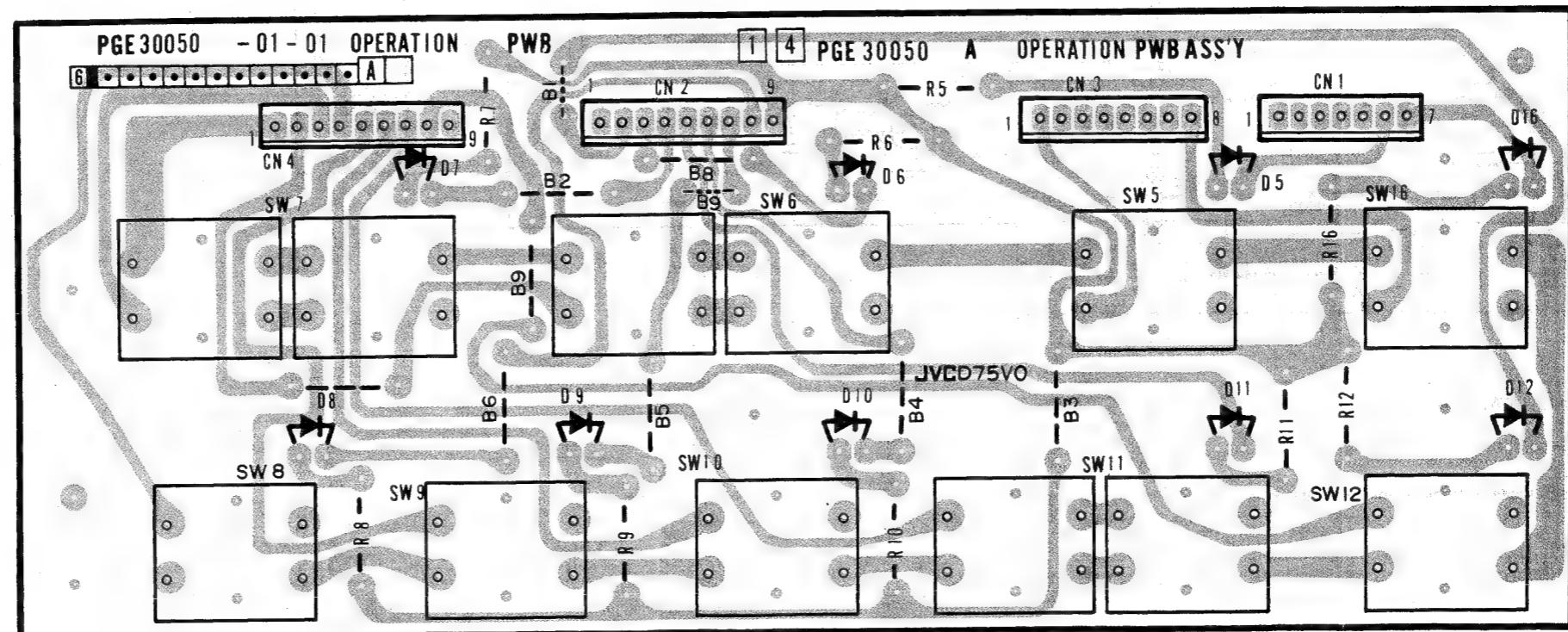
H

4-28

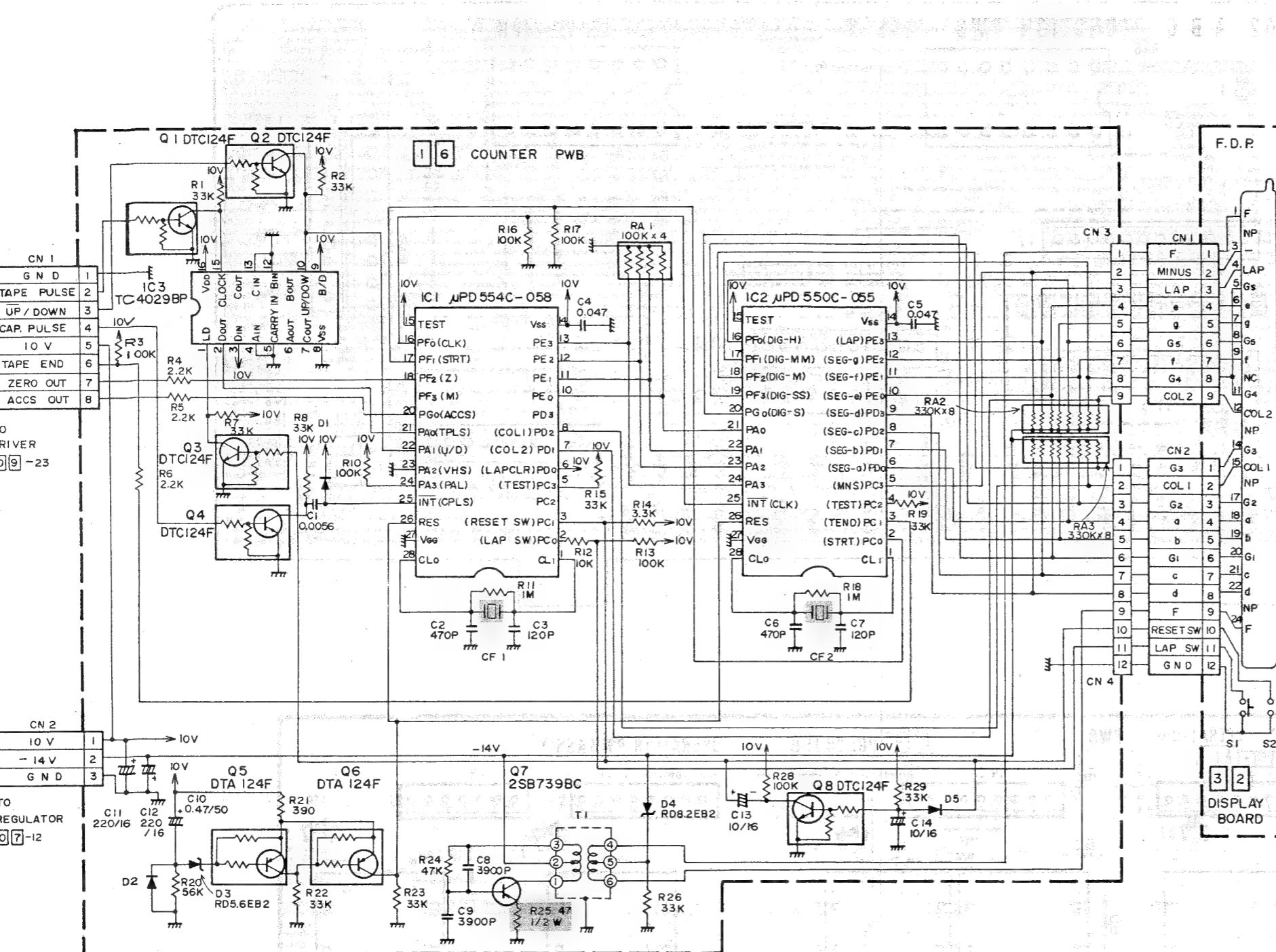
4.29 JUNCTION CIRCUIT BOARD



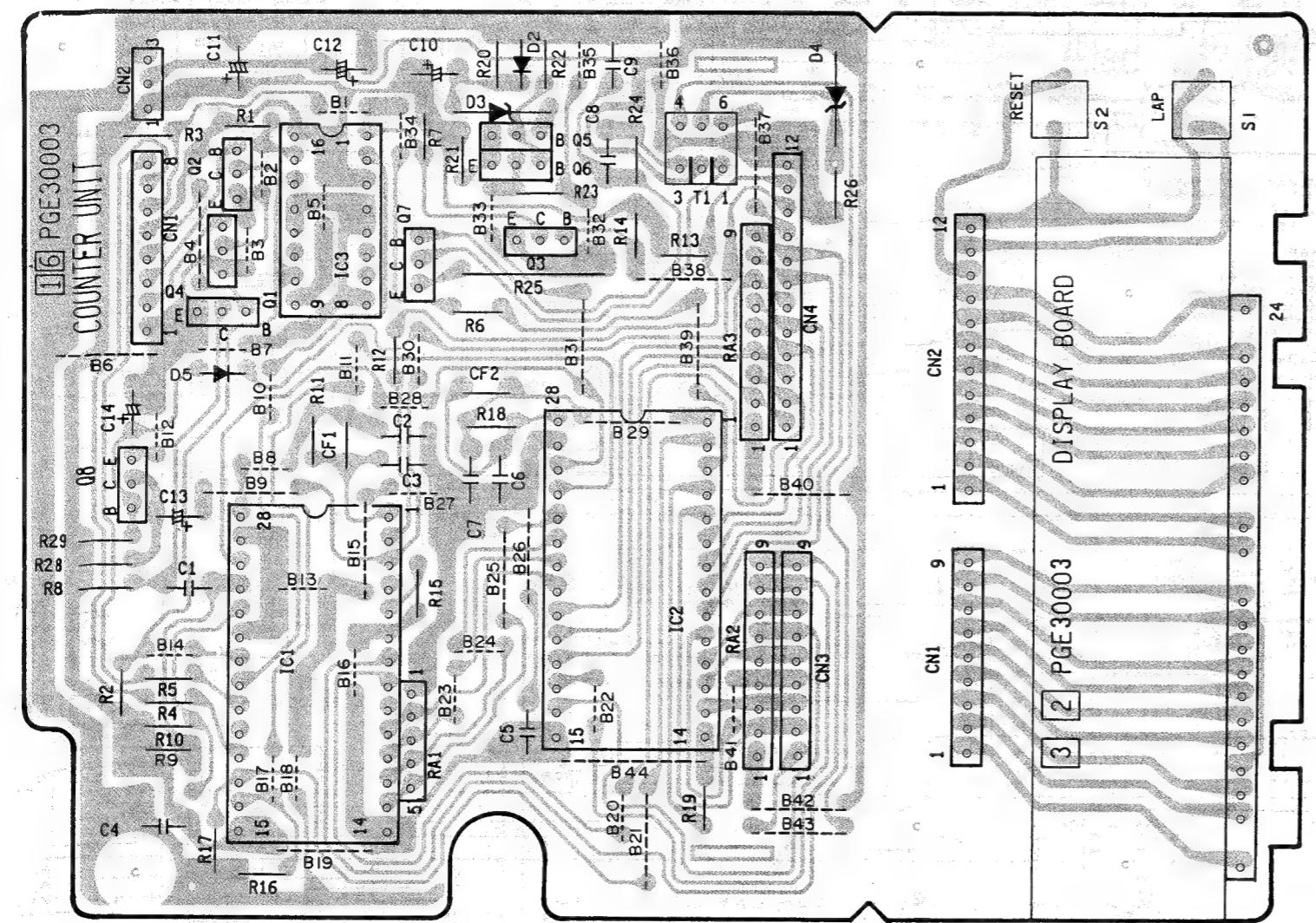
4.30 OPERATION CIRCUIT BOARD



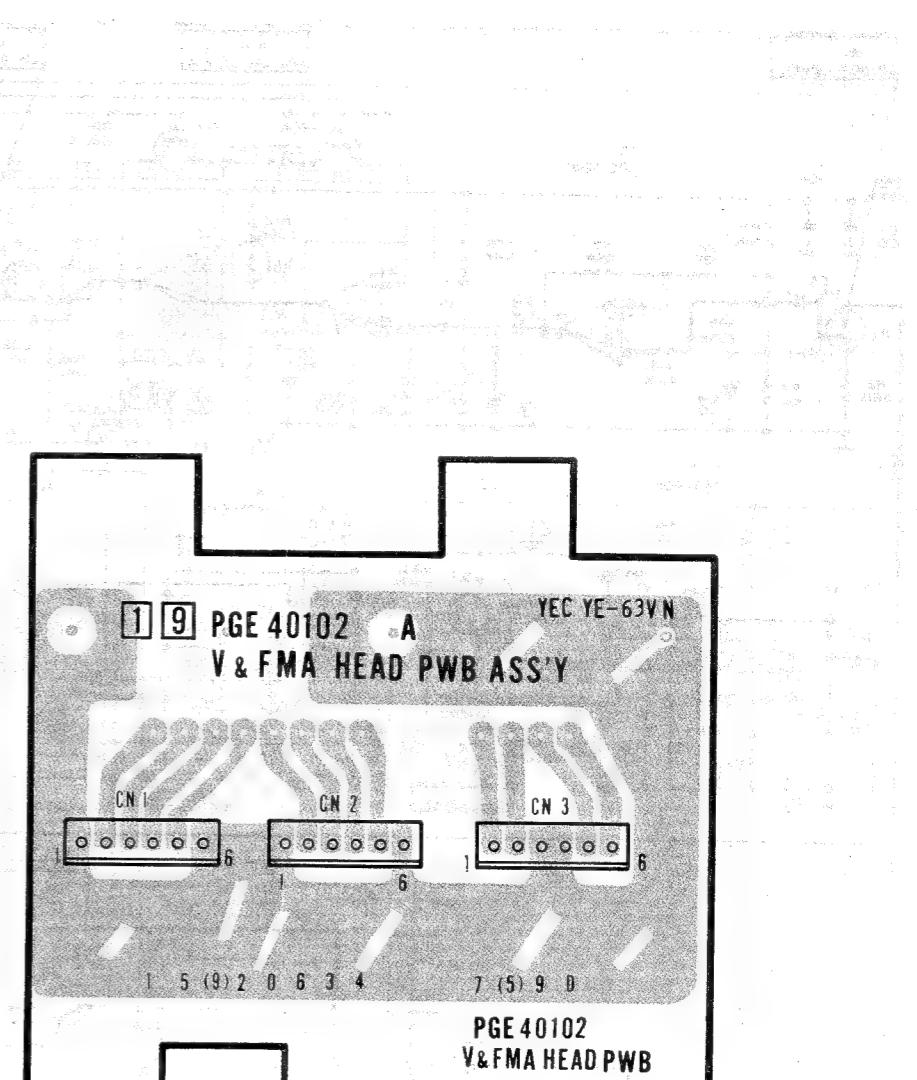
4.31 COUNTER SCHEMATIC DIAGRAM



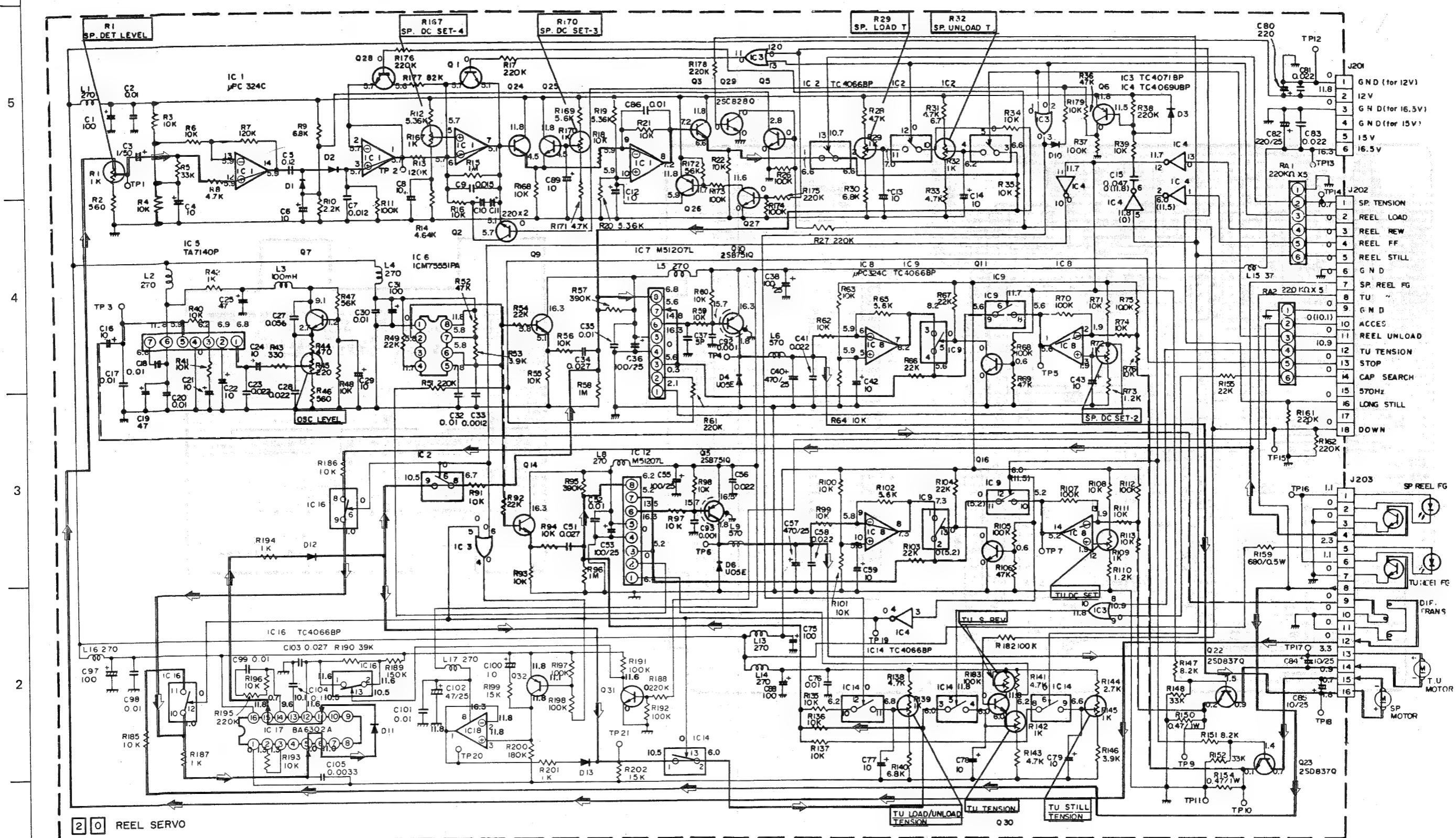
4.33 COUNTER CIRCUIT BOARD



4.34 V. & FMA HEAD CIRCUIT BOARD



4.35 REEL SERVO SCHEMATIC DIAGRAM



NOTES: Unless otherwise specified;

1. All resistance values are in ohms. (1/6W), (1/8 W).
2. All inductance values are in μH .
3. Voltages are DC-measured with a digital voltmeter during recording mode.
4. Where voltage differs between recording and playback, the voltage during playback is shown in parentheses.

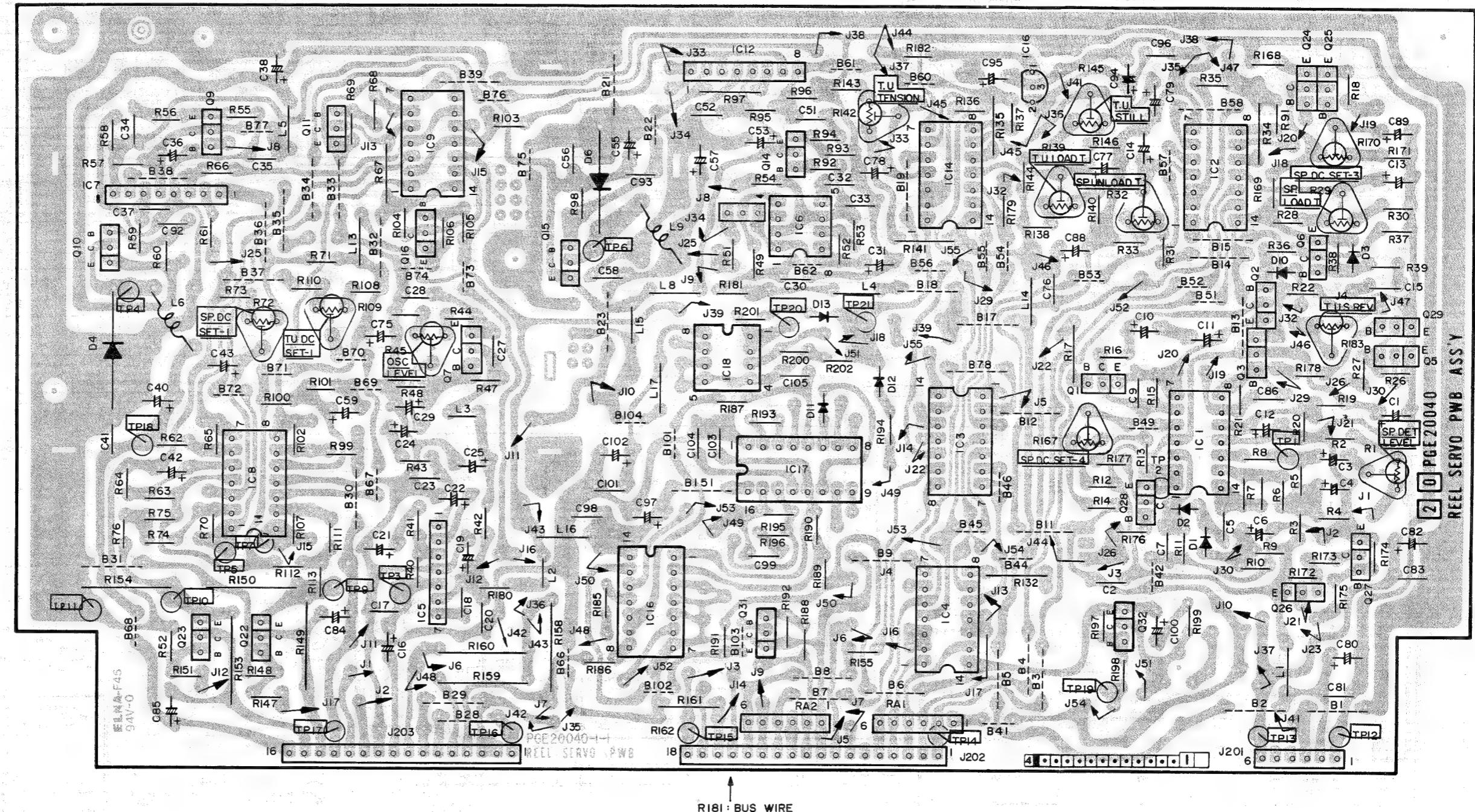
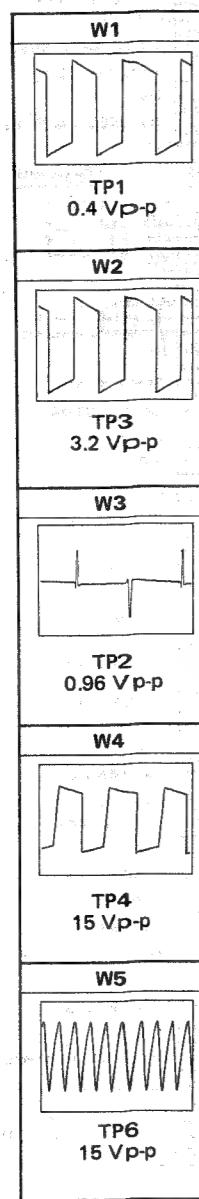
5. Shaded (■) parts are critical for safety. Replace only with specified part numbers.

6. NPN type transistors are 2SD636RS.
7. PNP type transistors are 2SB641RS.
8. All diodes are 1SS133.

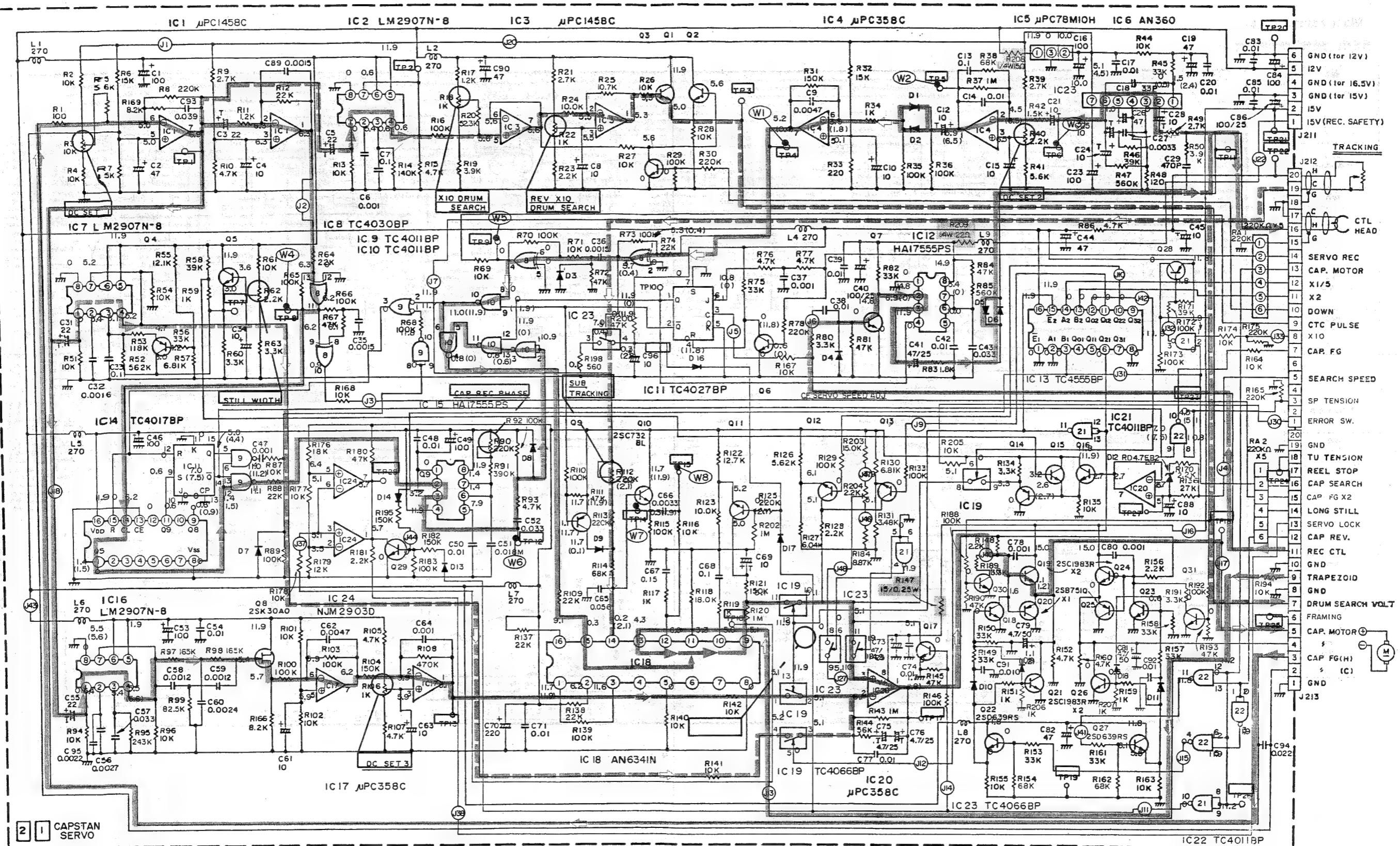
- ➡ RECORDING SIGNAL PATH
- ➡ PLAYBACK SIGNAL PATH
- ➡ REC PLAY SIGNAL PATH

4.36 REEL SERVO CIRCUIT BOARD

— Main waveforms of
REEL SERVO circuit —



4.37 CAPSTAN SERVO SCHEMATIC DIAGRAM



NOTES: Unless otherwise specified;

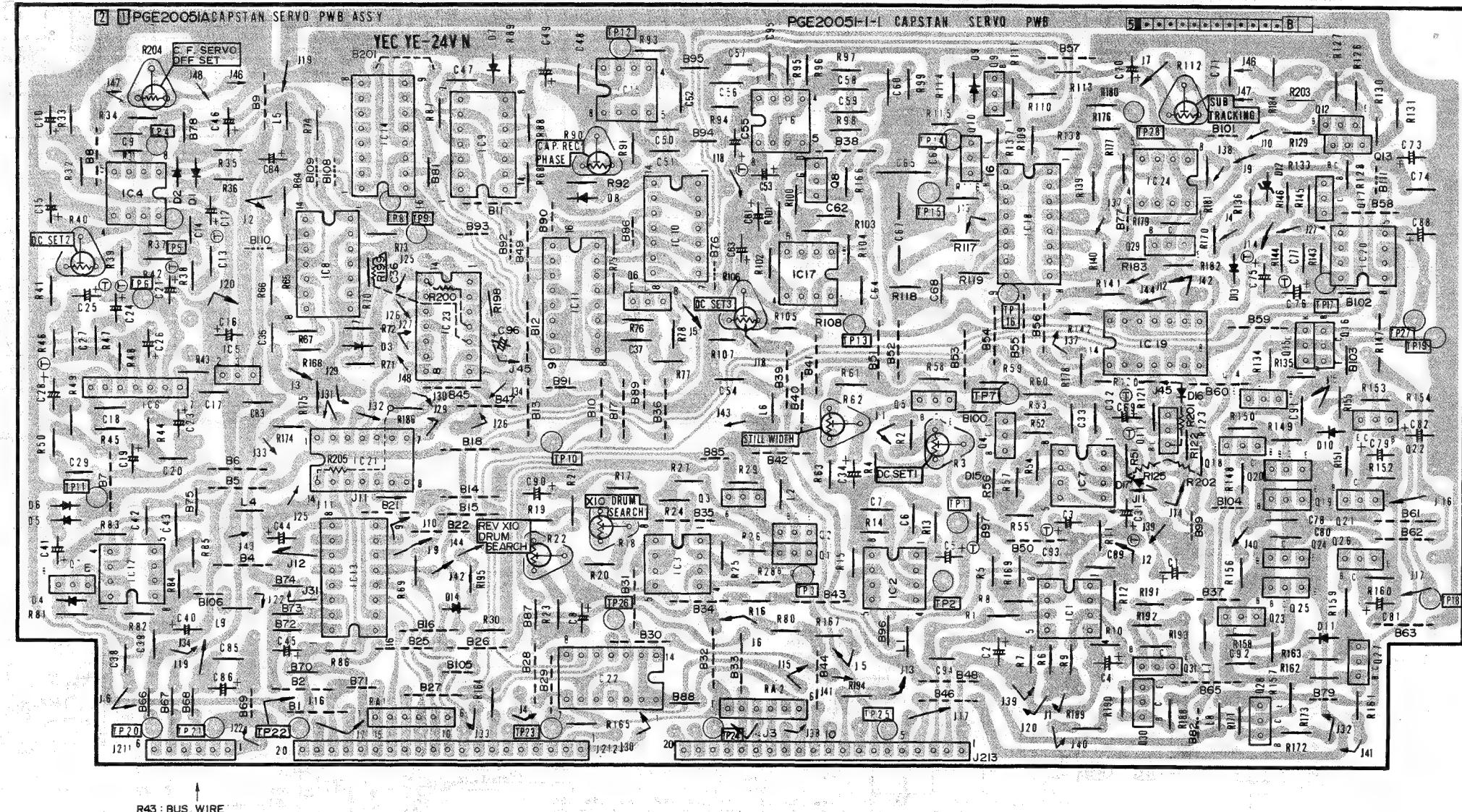
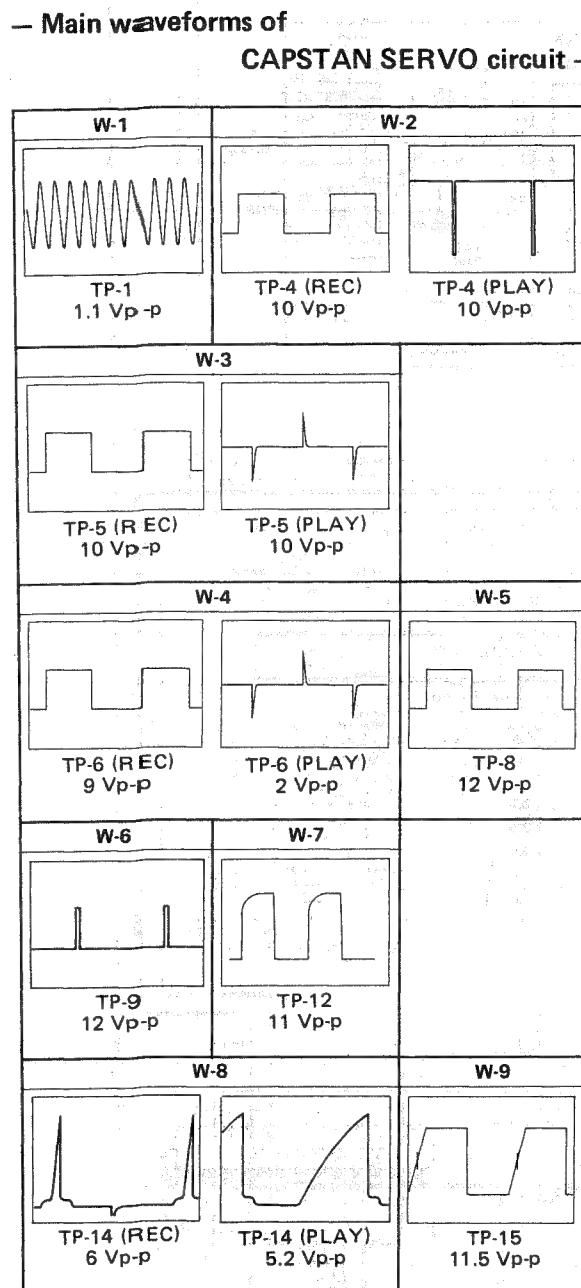
- All resistance values are in ohms. (1/6W), (1/8 W).
- All inductance values are in μ H.
- Voltages are DC-measured with a digital voltmeter during recording mode.
- Where voltage differs between recording and playback, the voltage during playback is shown in parentheses.

5. Shaded (■) parts are critical for safety. Replace only with specified part numbers.

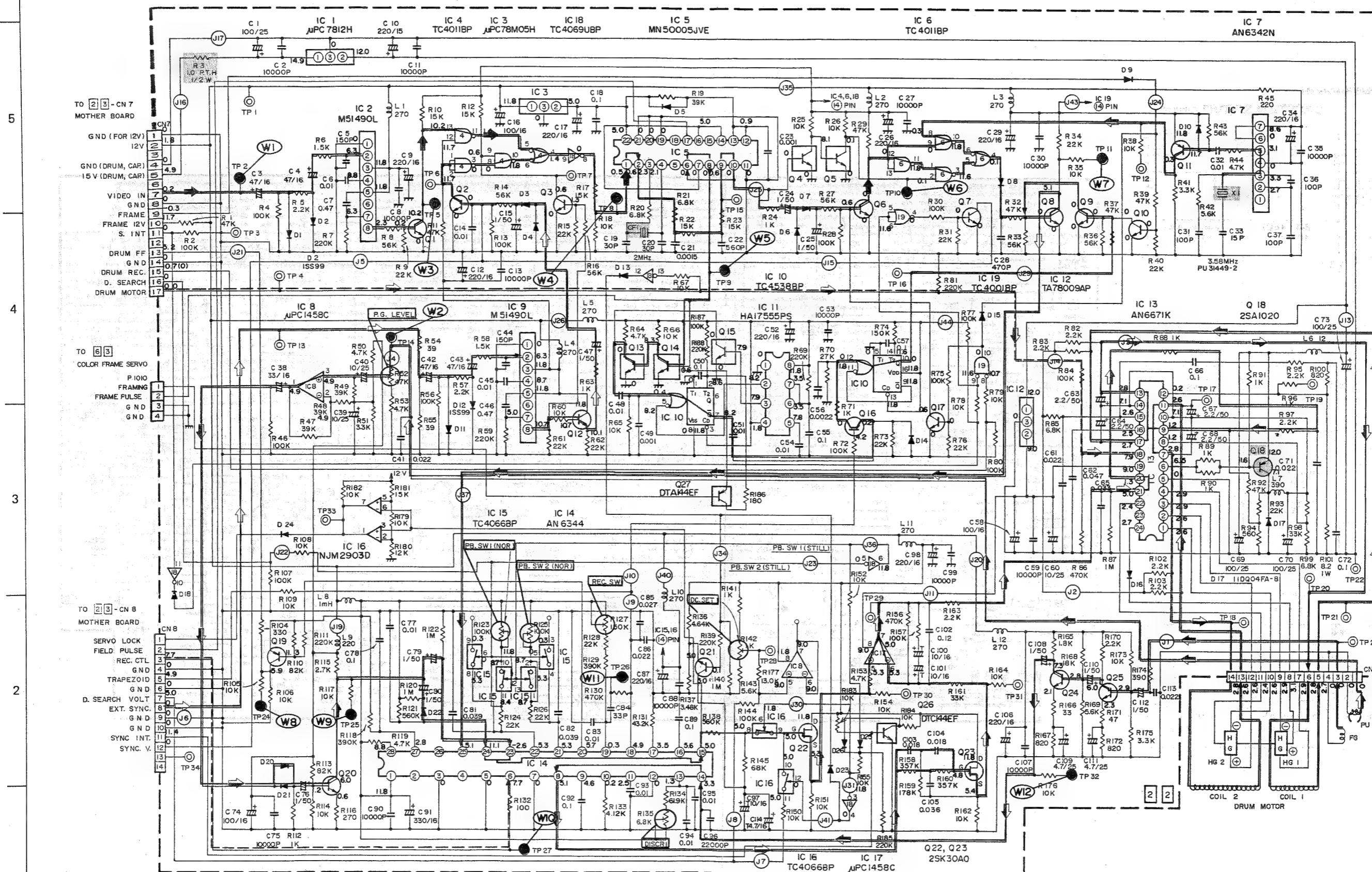
- NPN type transistors are 2SD636RS.
- PNP type transistors are 2SB641RS.
- All diodes are 1SS133.

- RECORDING SIGNAL PATH
→ PLAYBACK SIGNAL PATH
→ REC & PB SIGNAL PATH

4.38 CAPSTAN SERVO CIRCUIT BOARD



4.39 DRUM SERVO SCHEMATIC DIAGRAM



NOTES: Unless otherwise specified;

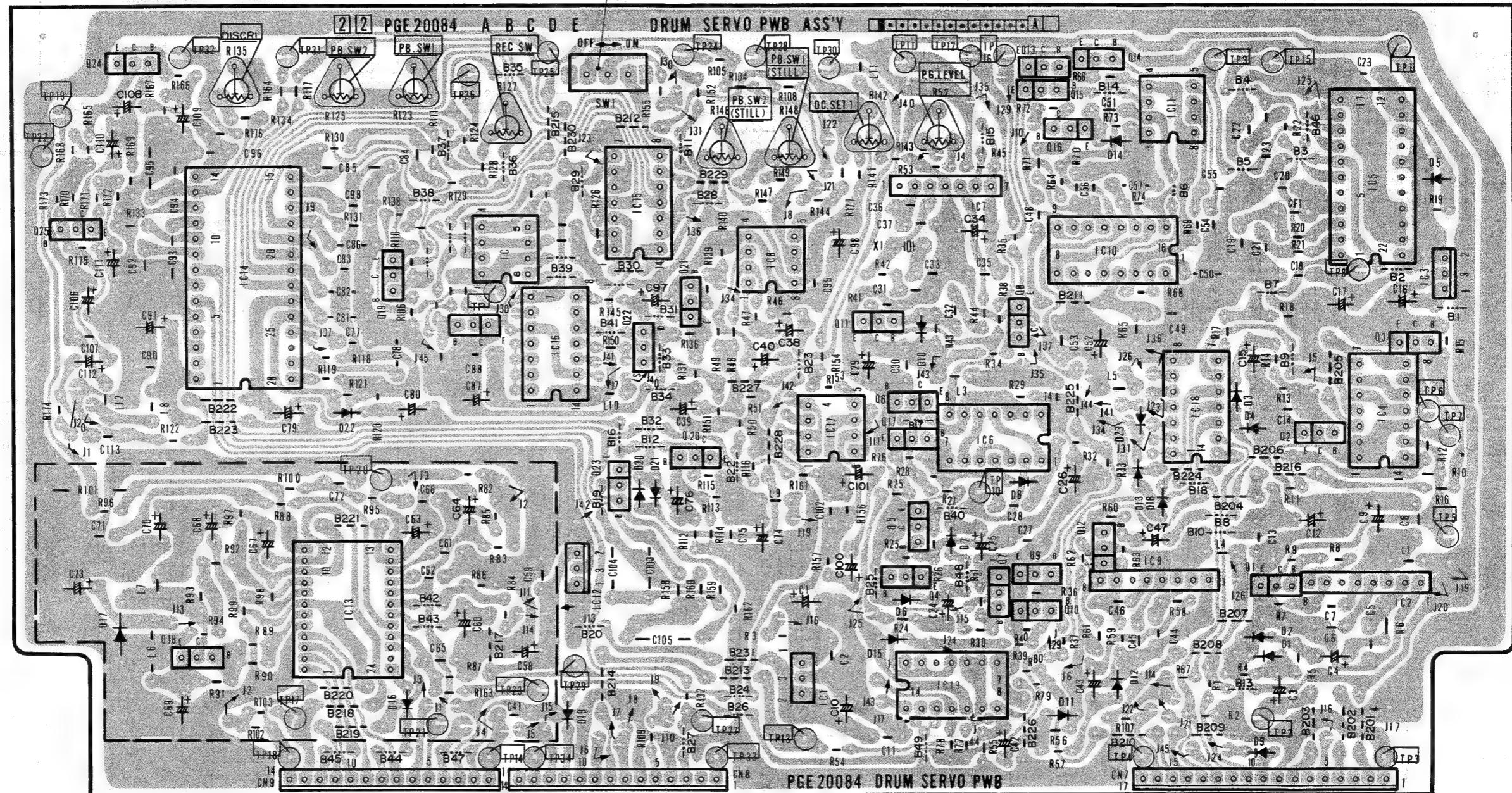
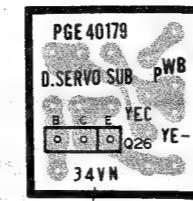
1. All resistance values are in ohms. (1/6W).
2. All inductance values are in μ H.
3. Voltages are DC-measured with a digital voltmeter during recording mode.
4. Where voltage differs between recording and playback, the voltage during playback is shown in parentheses.

5. Shaded (■) parts are critical for safety. Replace only with specified part numbers.

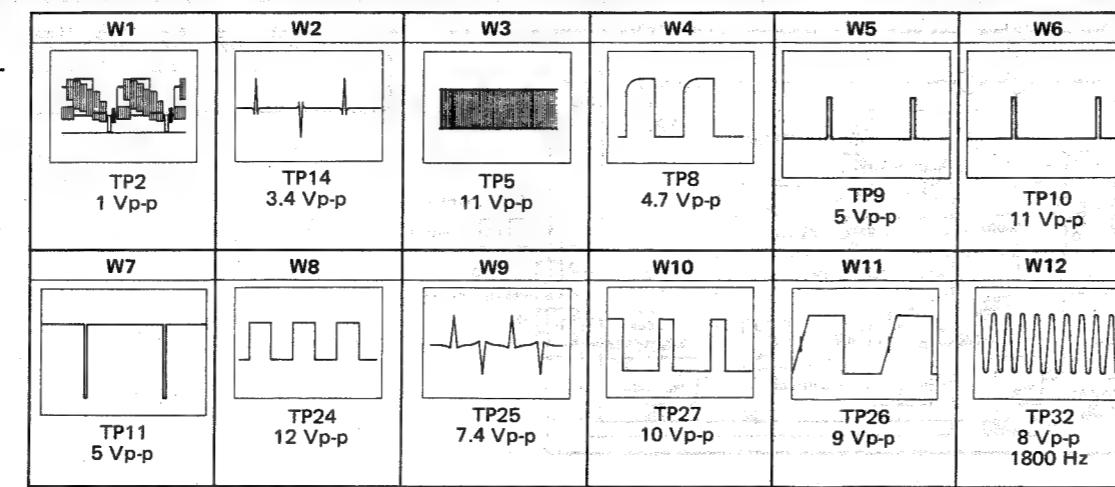
6. NPN type transistors are 2SD636RS.
7. PNP type transistors are 2SB641RS.
8. All diodes are 1SS133.

- ➡ RECORDING SIGNAL PATH
- ➡ PLAYBACK SIGNAL PATH
- ➡ REC PLAY SIGNAL PATH

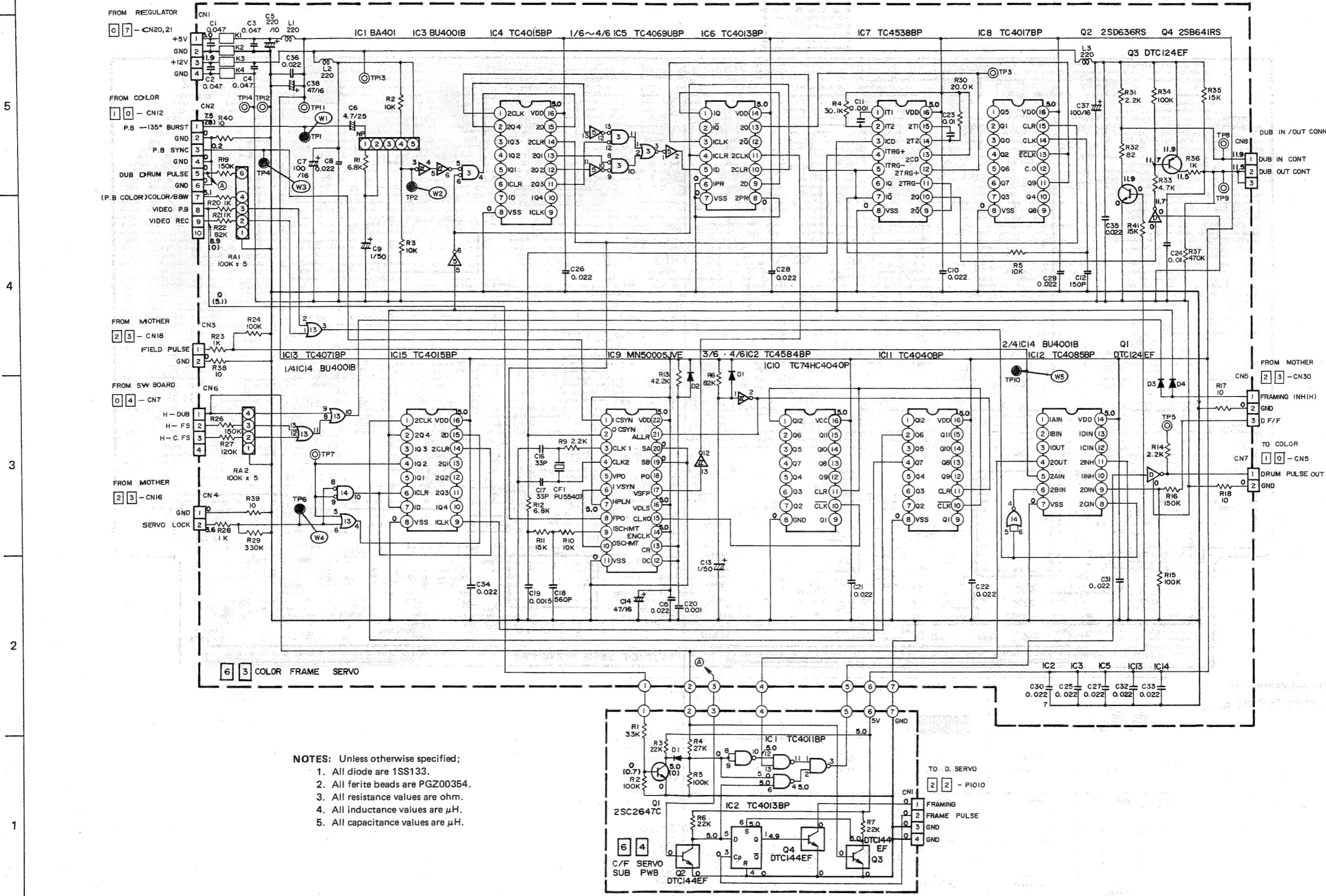
4.40 DRUM SERVO CIRCUIT BOARD



— Main waveforms of DRUM SERVO circuit —

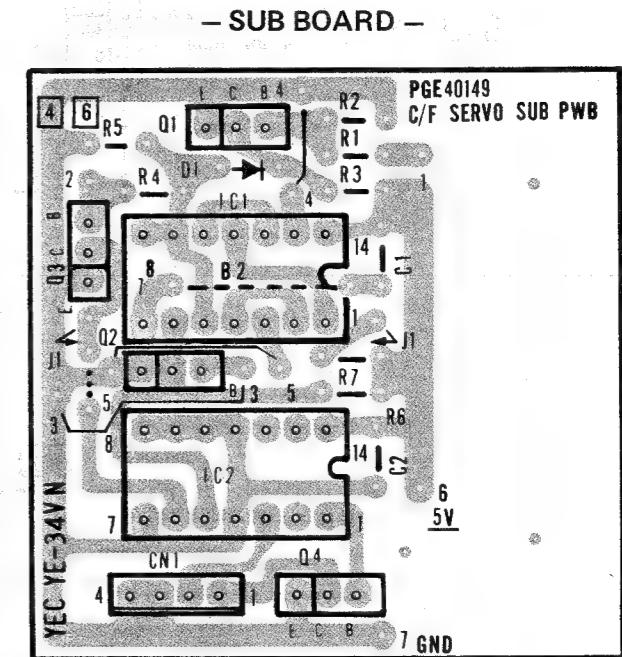
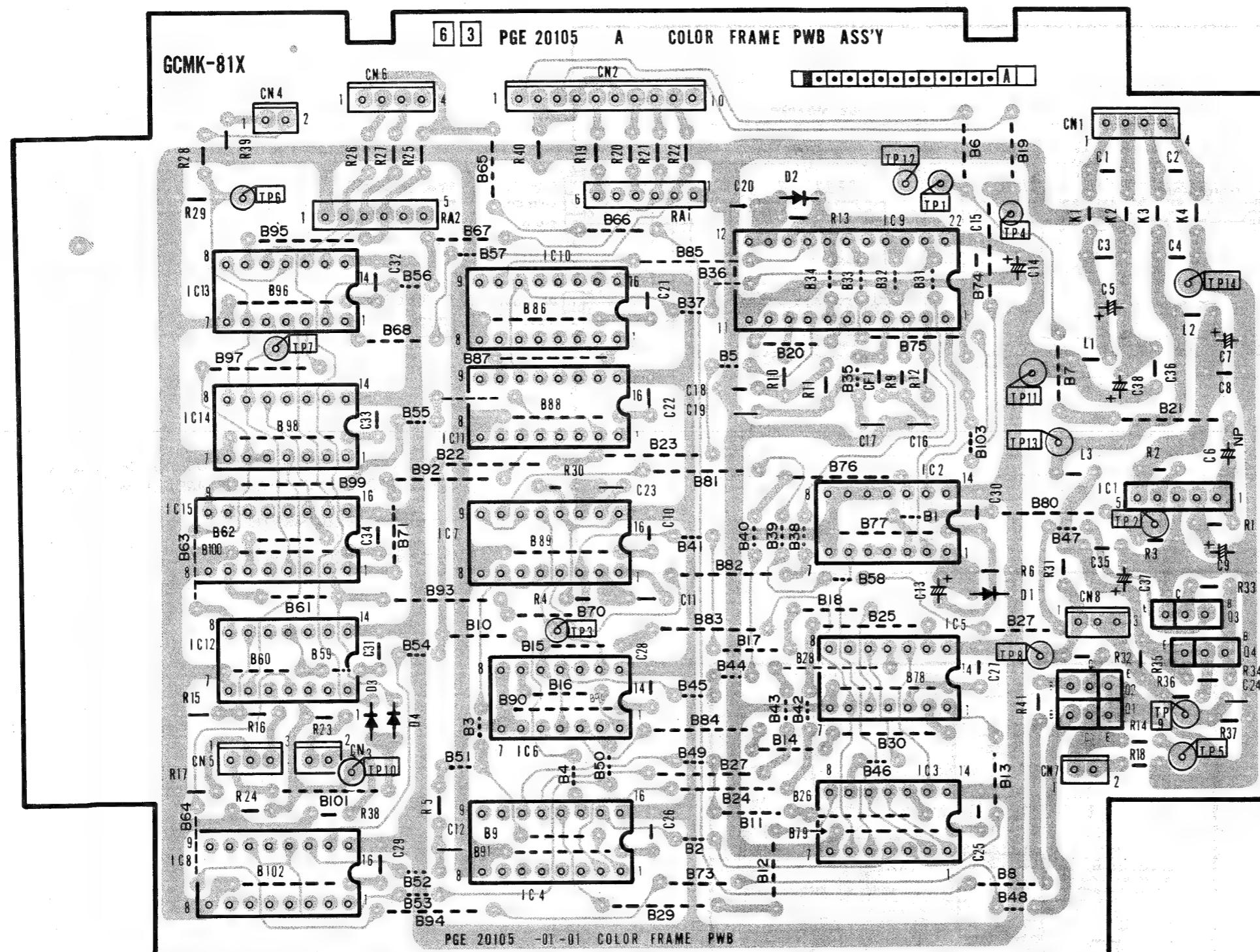


4.41 COLOR FRAME SERVO SCHEMATIC DIAGRAM

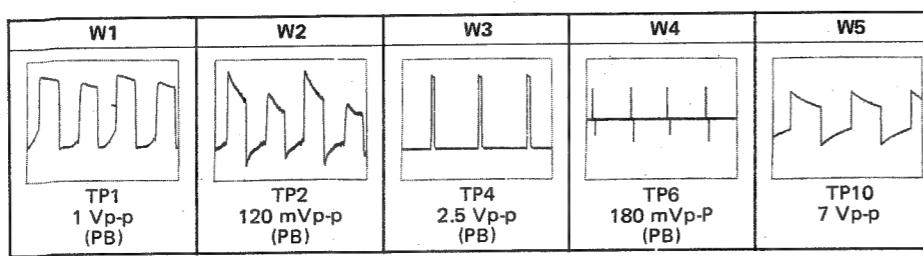


A B C 4-38 4-38 E F G H

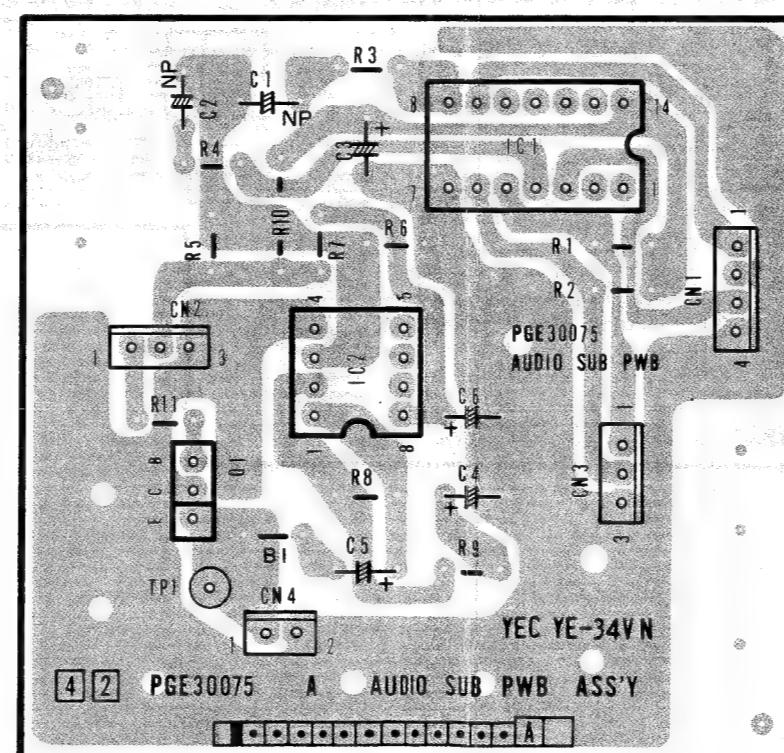
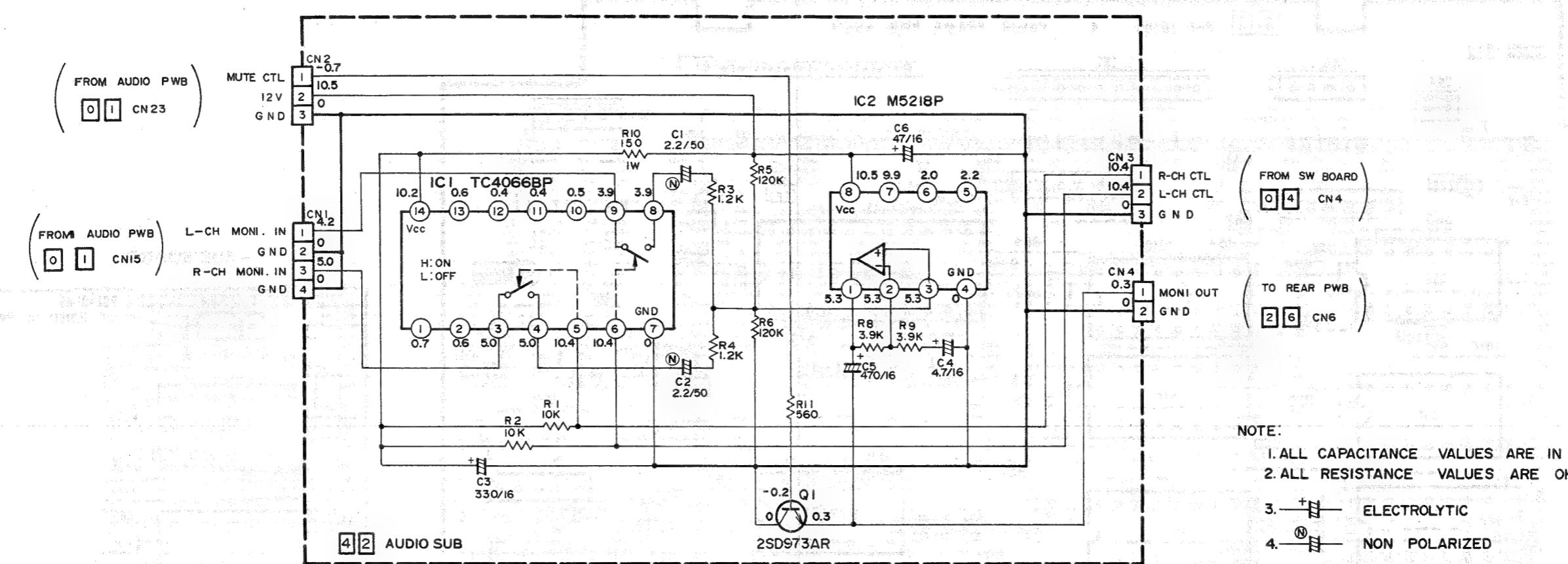
4.42 COLOR FRAME SERVO AND SUB CIRCUIT BOARDS



— Main waveforms of COLOR FRAME SERVO circuit —



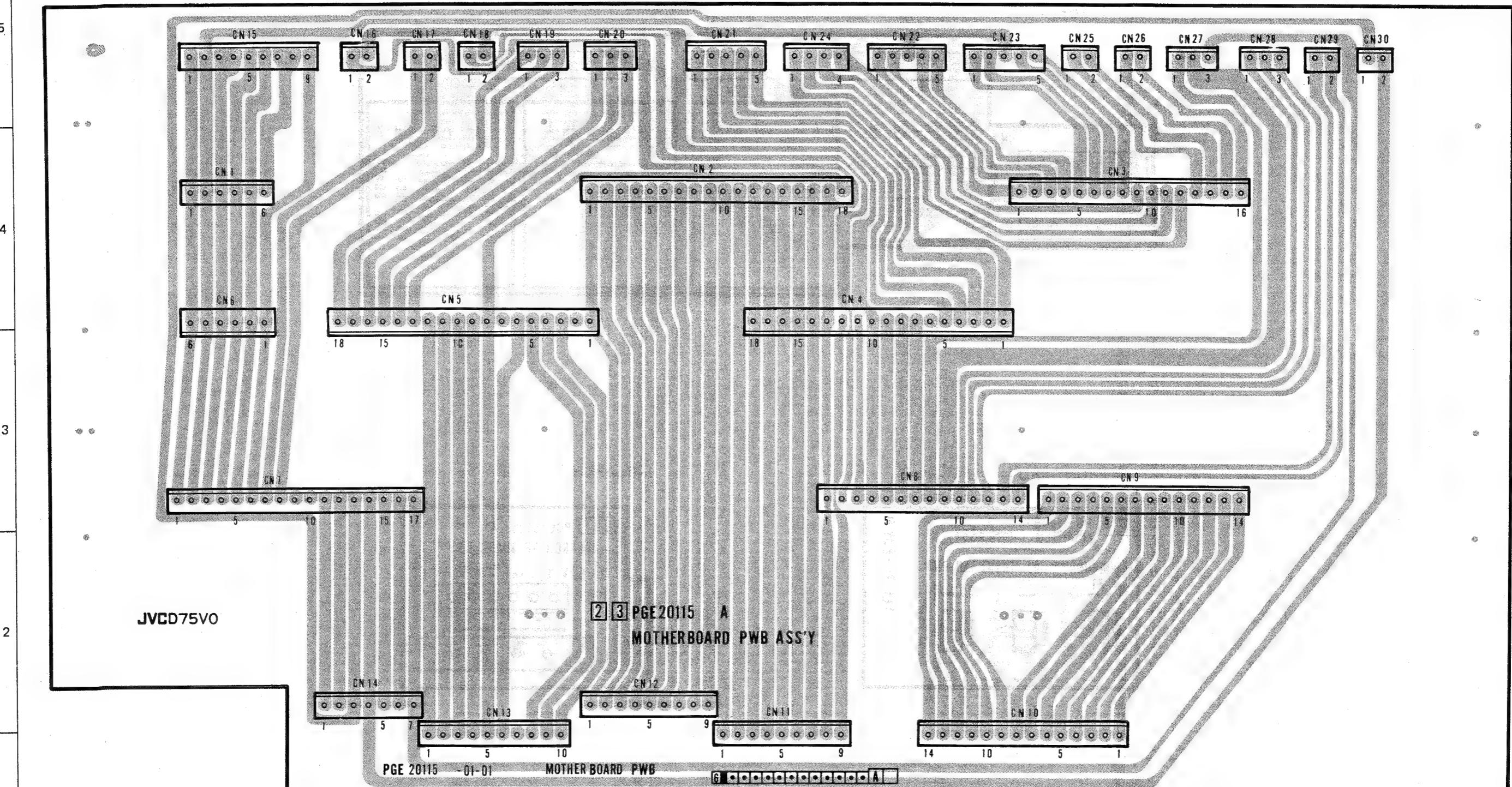
4.43 AUDIO SUB SCHEMATIC DIAGRAM AND CIRCUIT BOARD



A B C D E F G H

4.44 MOTHER CIRCUIT BOARD

EXCERPT FROM THE DRAWING OF THE MOTHER CIRCUIT BOARD



1

A B C D E F G H

4-41

4-41

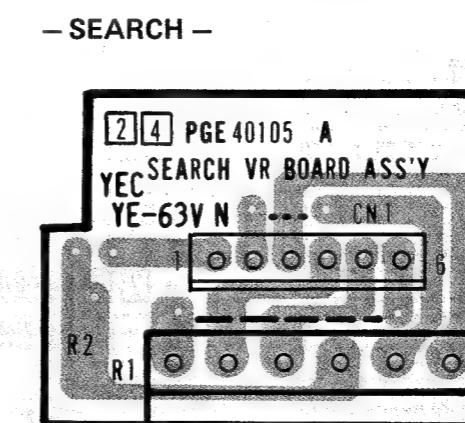
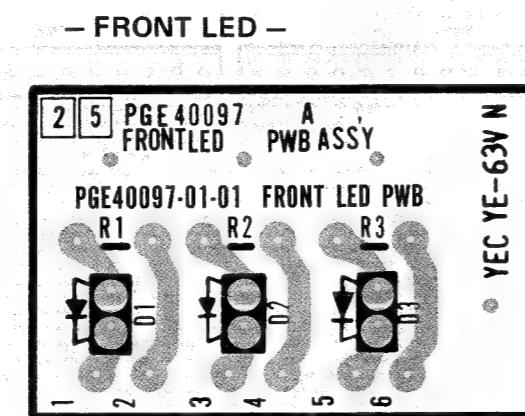
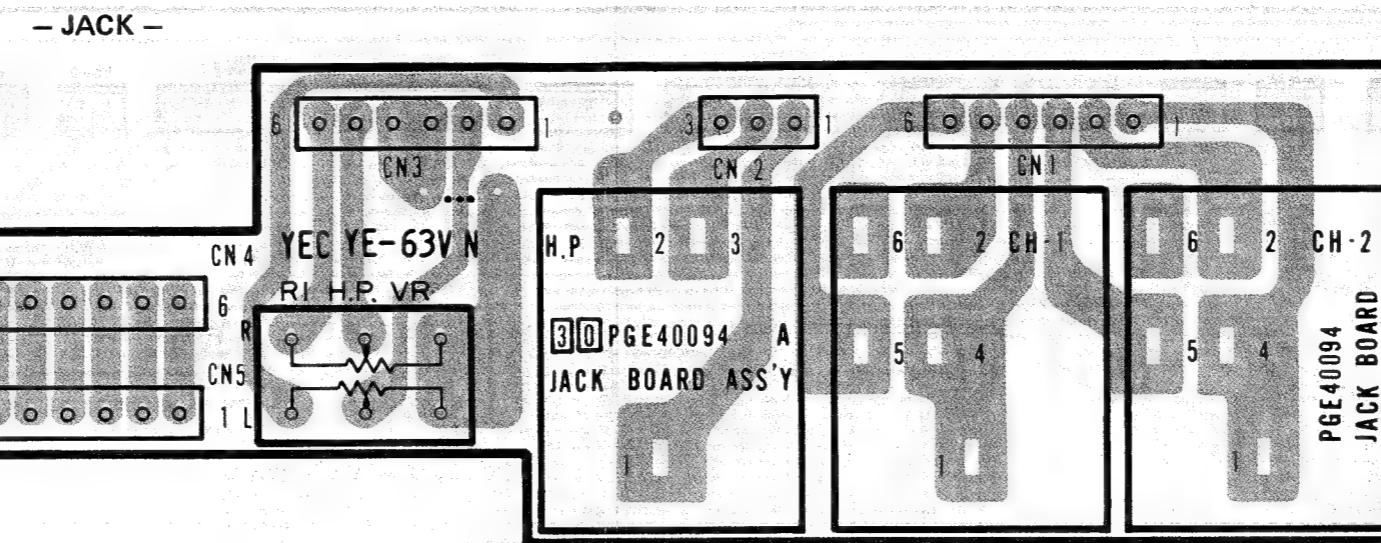
E

F

G

H

4.45 SEARCH, FRONT LED & JACK CIRCUIT BOARDS

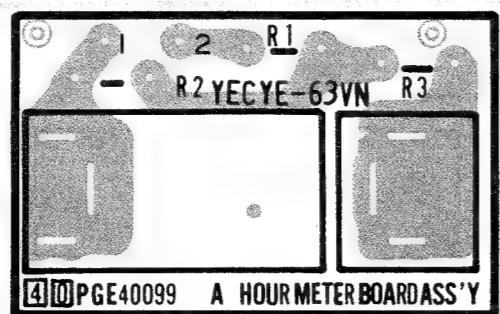


4.46 PICK-UP, HOUR METER, CASSETTE, HOUSING, END SENSOR & LED CIRCUIT BOARDS

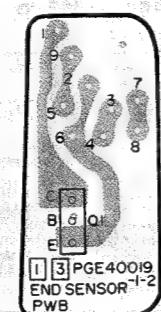
- PACK-UP -



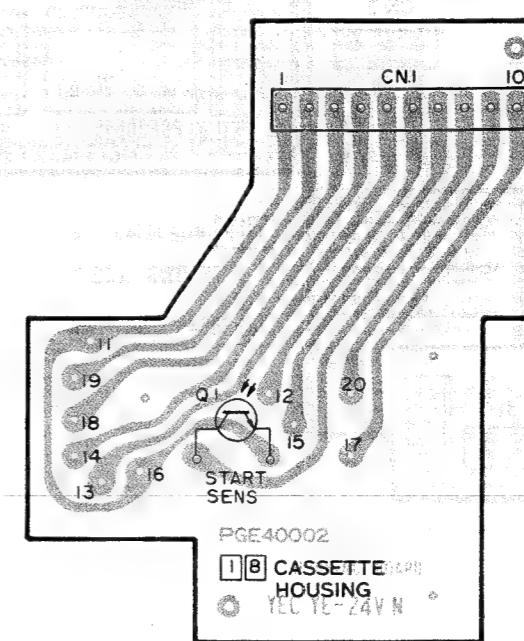
- HOUR METER -



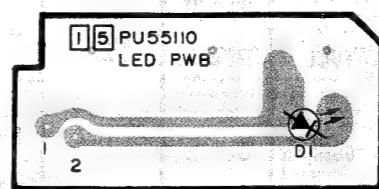
- END SENSOR -



- CASSETTE HOUSING -



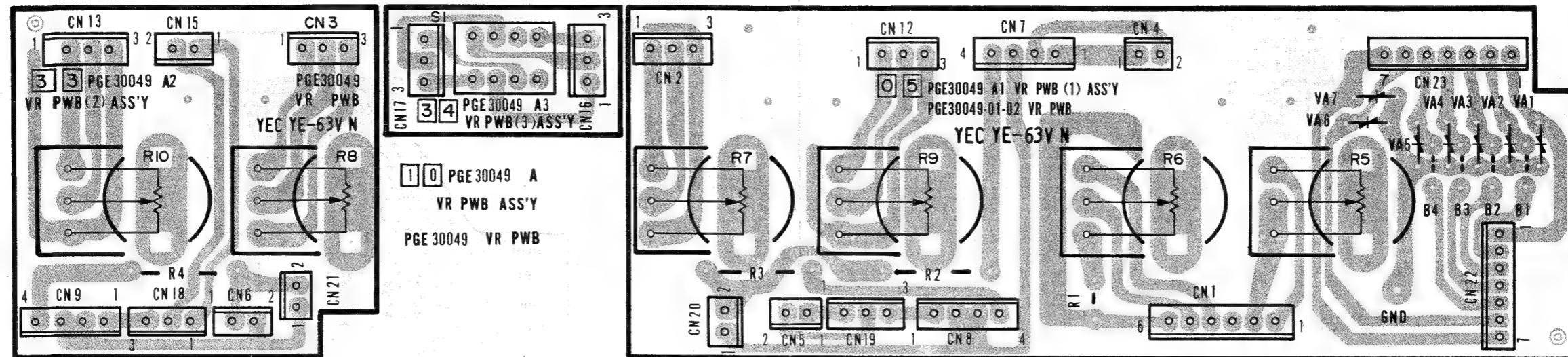
- LED -



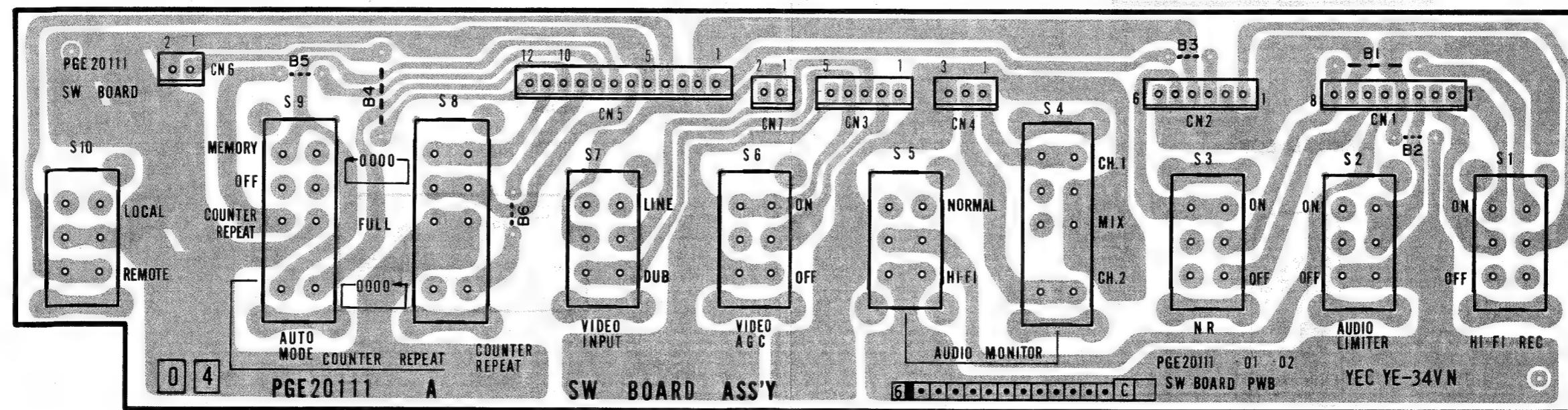
A B C D E F G H

4.47 VR, SWITCH CIRCUIT BOARDS

- VR -

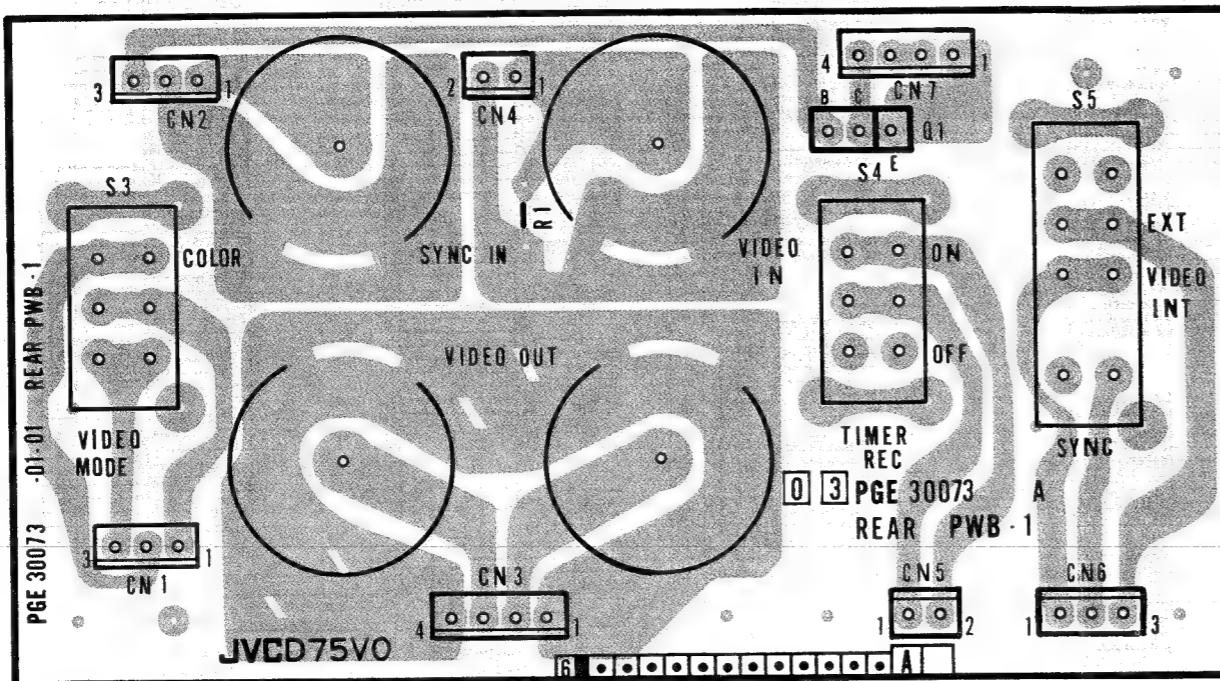


- SWITCH -

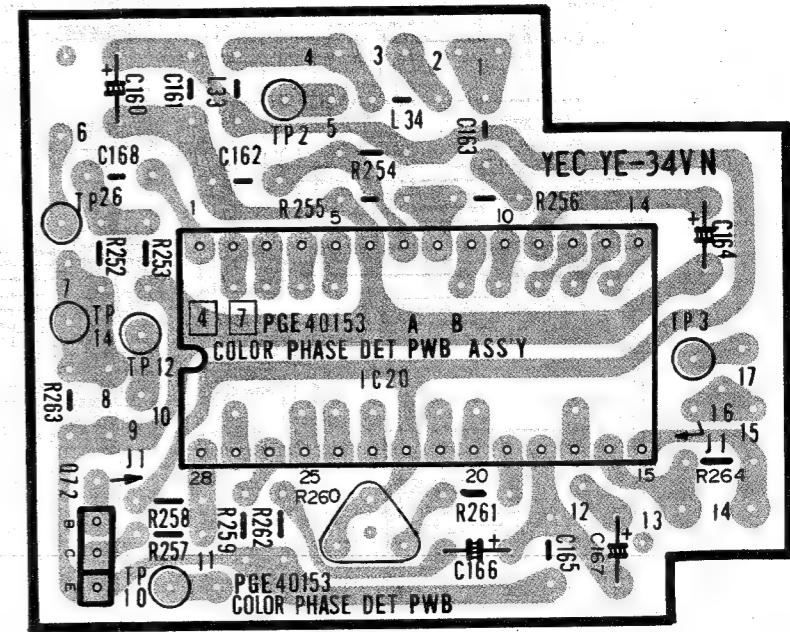


A B C D E F G H

4.48 REAR CIRCUIT BOARDS



4.49 COLOR PHASE DET CIRCUIT BOARDS



AUDIO INPUT SW

REAR PWB - 2

PGE 30074

2 6 PGE 30074 A
REAR PWB - 2

6

LEFT **RIGHT**

NORMAL

IN

HIFI

YEC YE-34VN

OUT

HIFI

S1

HCOM

SEP

NCOM

CN1

CN2

CN3

CN4

CN5

CN6

CN7

CN8

CN9

R1

R2

MONITOR OUT

MODE 1

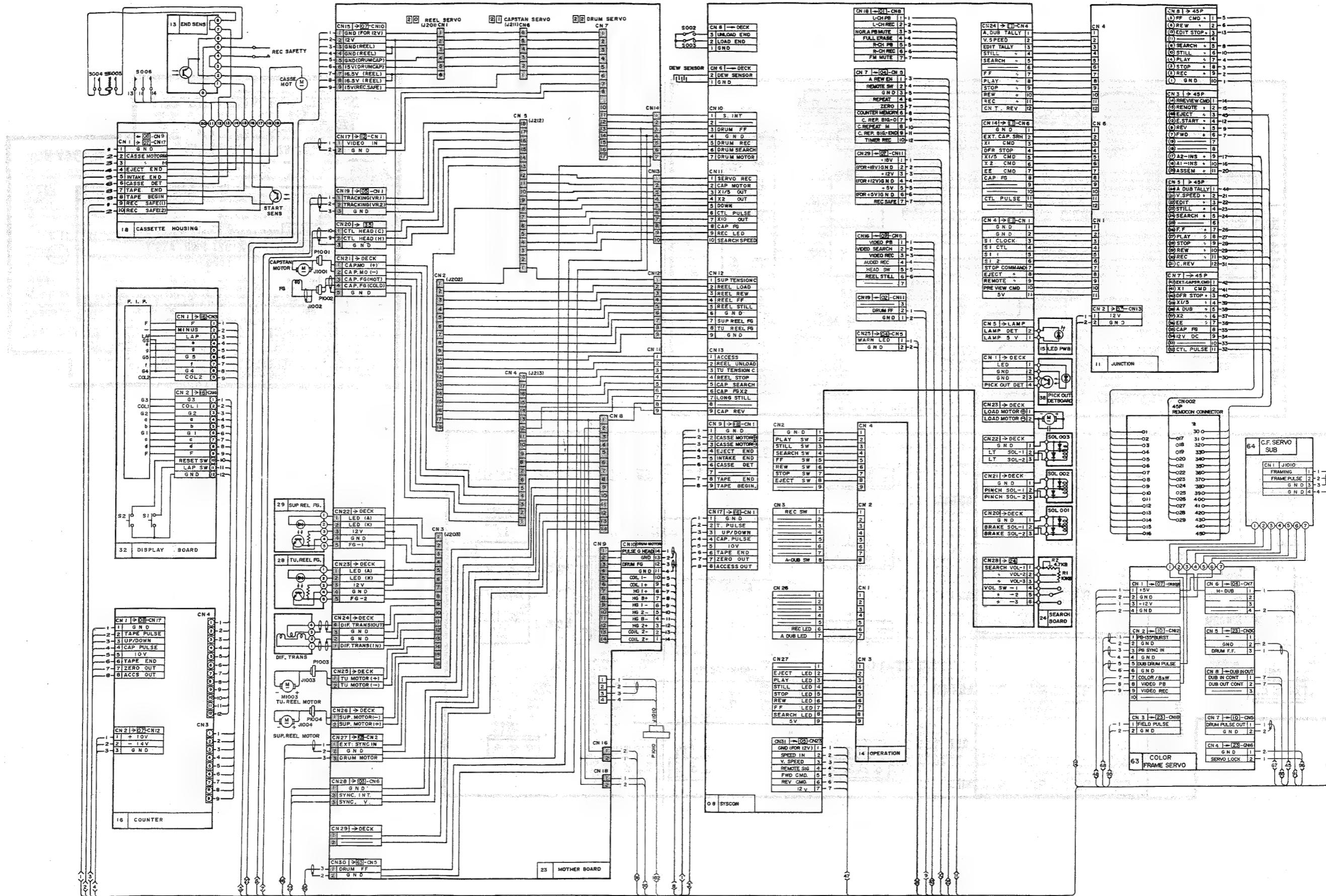
MODE 2

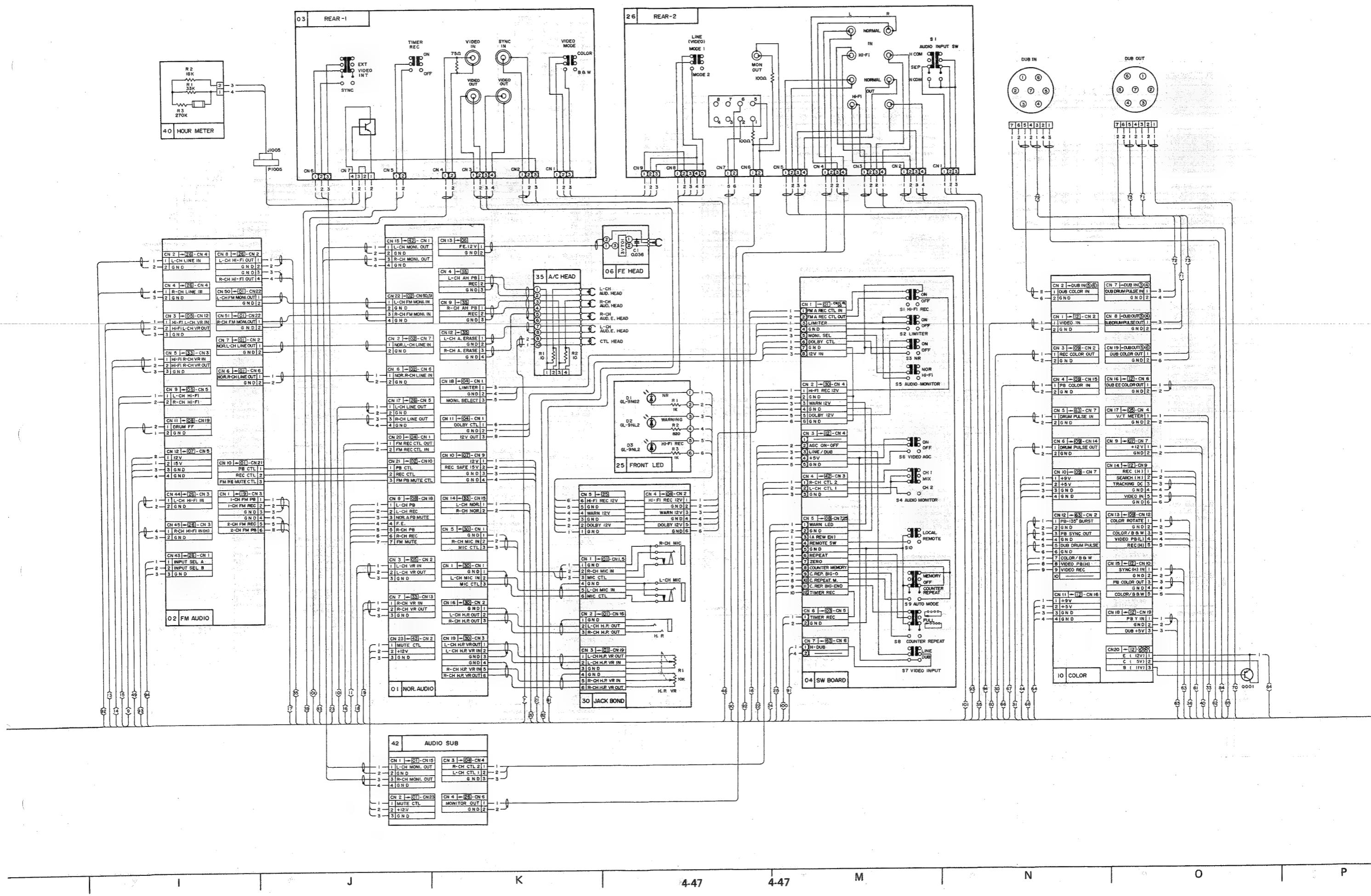
LINE (VIDEO) S2

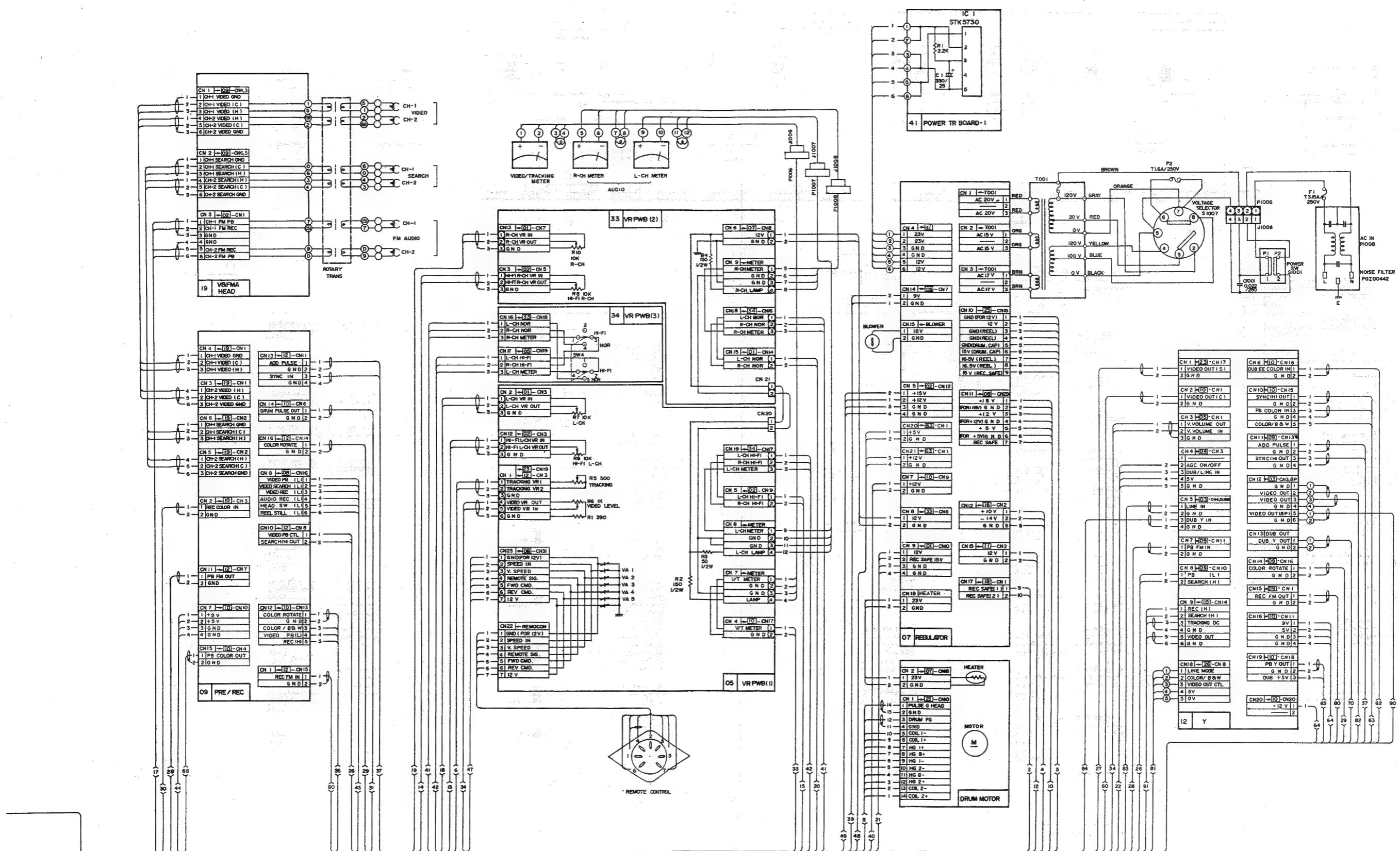
2 6

REAR PWB - 2

4.50 OVERALL WIRING DIAGRAM







Q

R

S

T 4-48

4-48

U

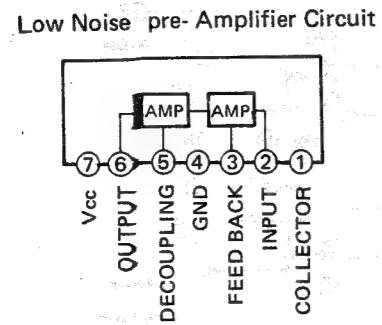
V

W

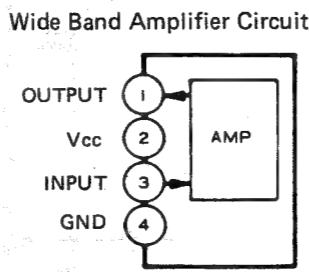
X

4.51 IC BLOCK DIAGRAMS

— AN360 —

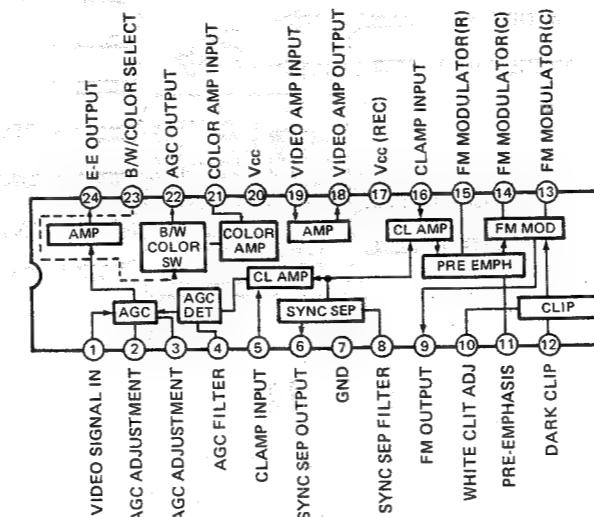


— AN607P —



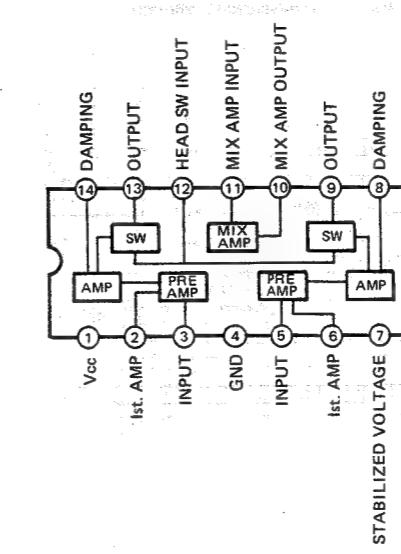
— AN6310 —

VTR Recoding Video Signal Processing Circuit



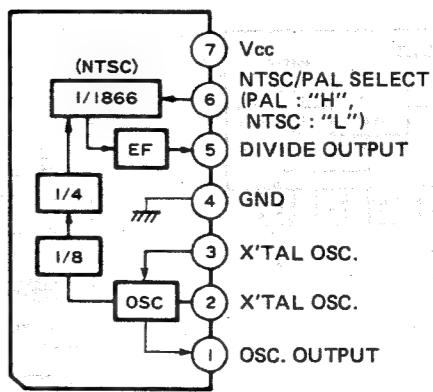
— AN6330 —

VTR Head Amplifier Circuit



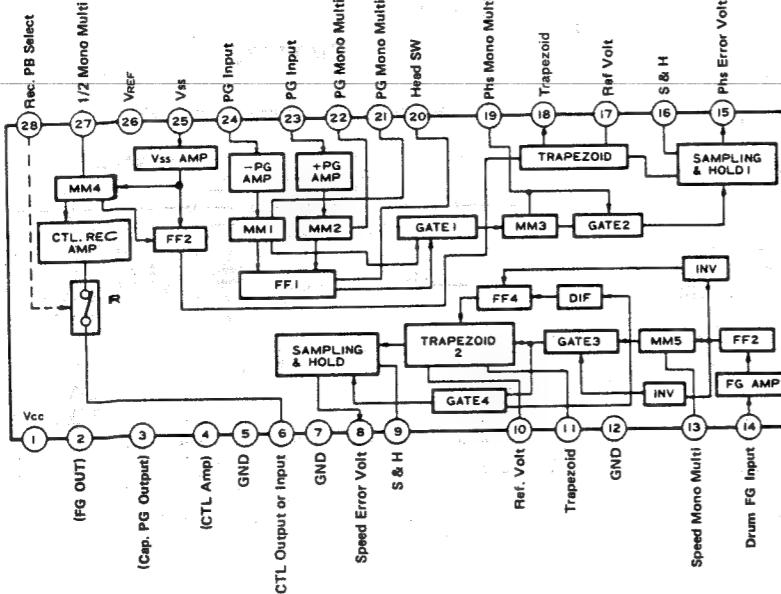
— AN6342 —

VTR Reference Frequency Divider

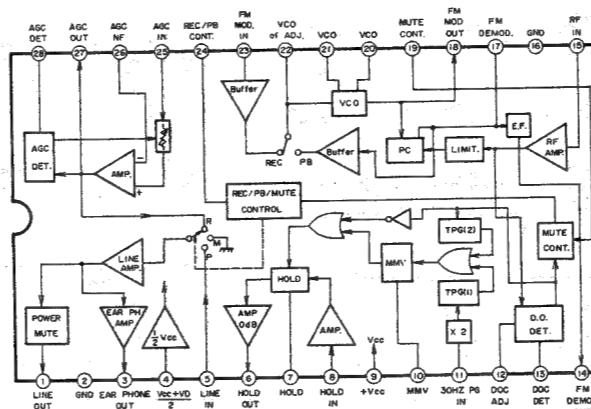


— AN6344N —

VTR Drum Servo Control

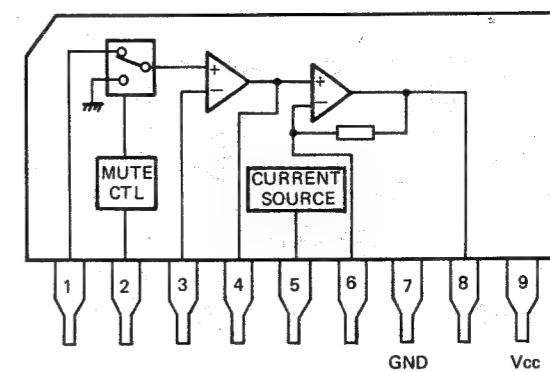


— AN6391S —

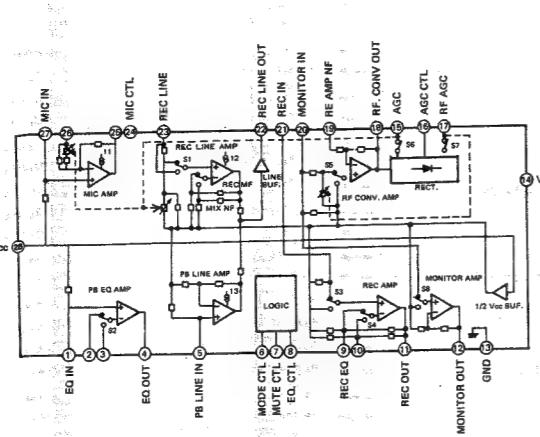


— AN6392 —

VTR REC Amplifier

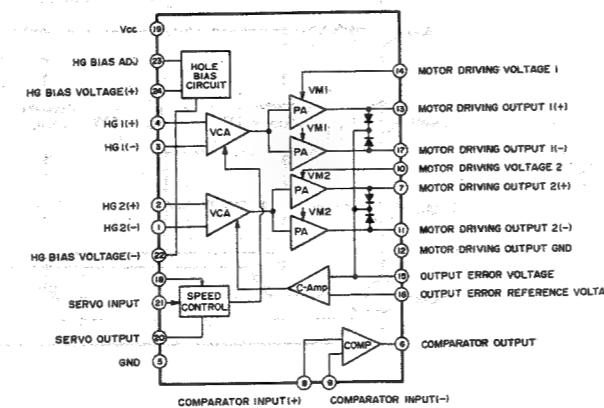


— AN6394 —



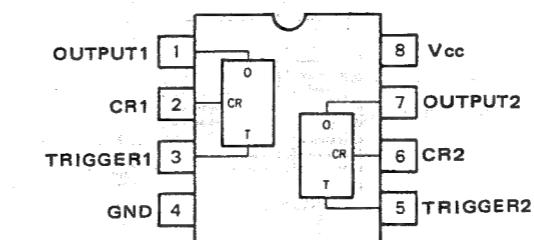
— AN6671K —

VTR Drum Motor Drive Circuit



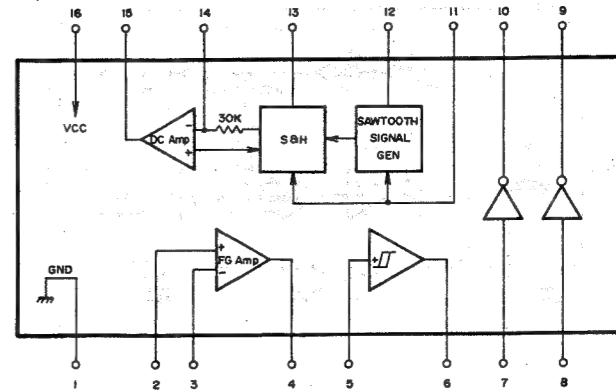
— BA226F-T2 —

Dual Monostable Multivibrator

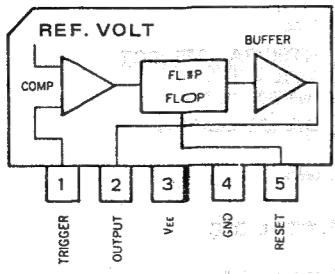


— BA6302A —

VTR Motor-Speed Control Circuit

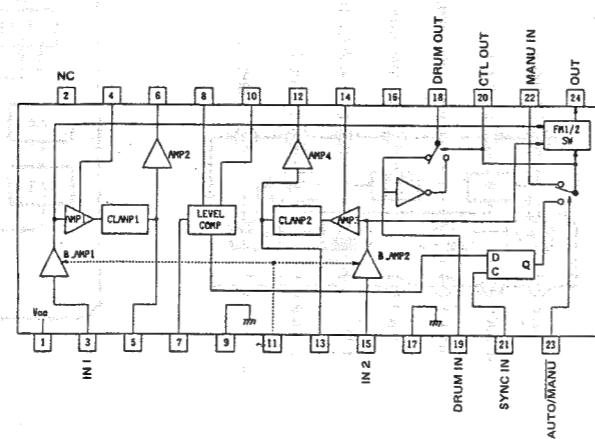


- BA634/F-T2 -

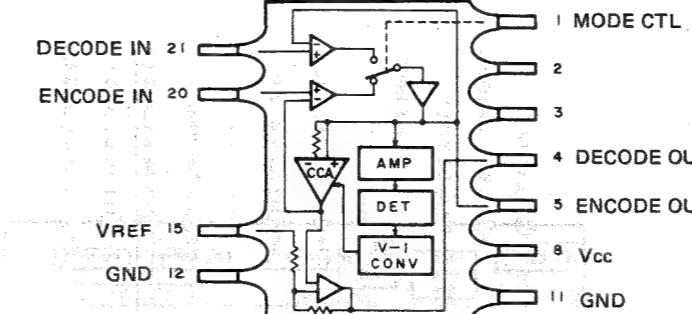


- BA7036LS -

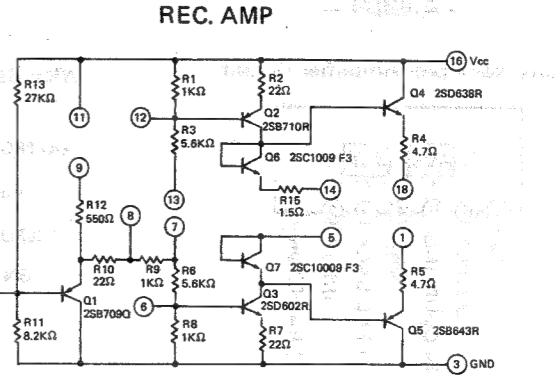
Switcher for VTR Noiseless Search



- EHM-X42U50A -

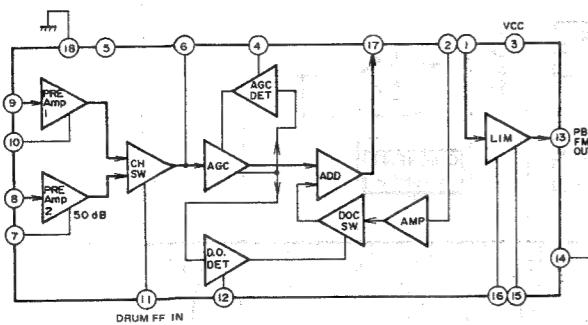


- EHM-822A29 -



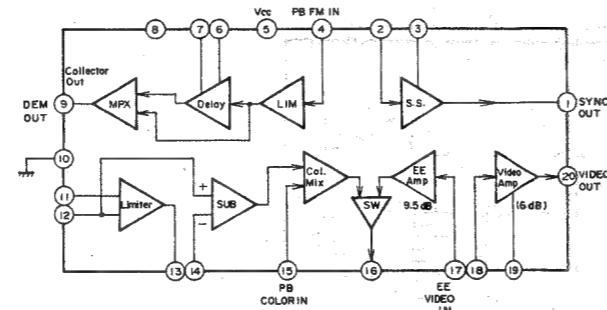
- HA11702 -

VTR PB Preamplifier



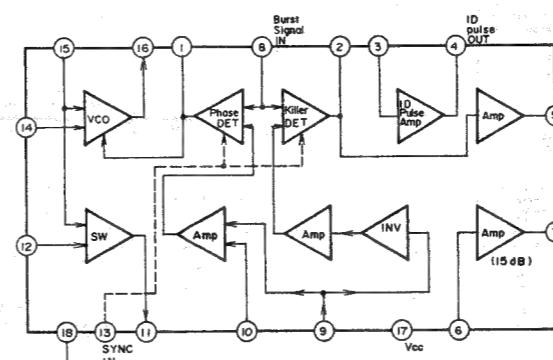
- HA11703 -

VTR FM Demodulator



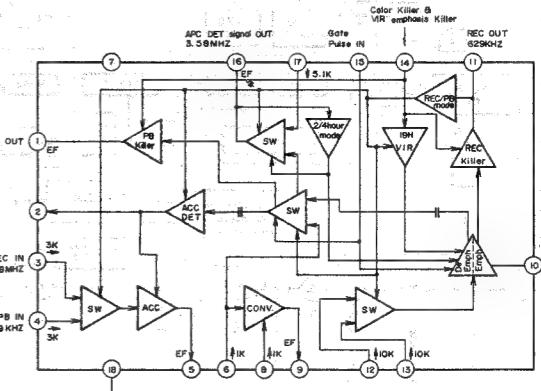
- HA11706 -

VTR Color APC



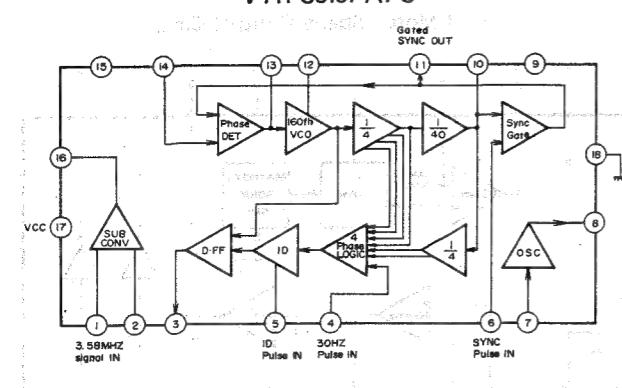
- HA11710 -

VTR Chroma Signal Processor



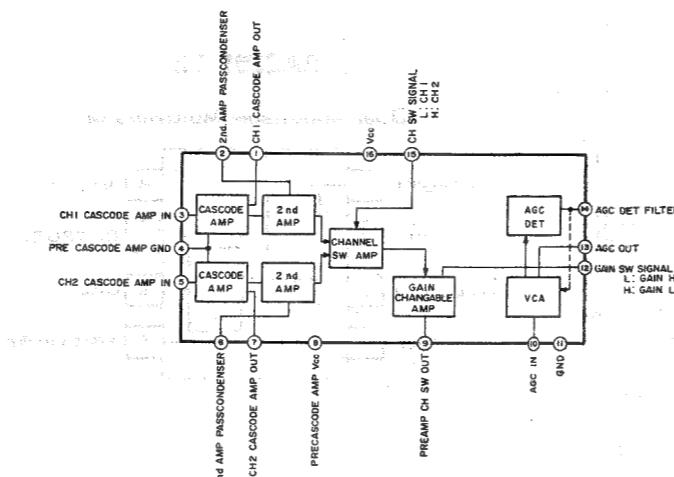
- HA11717 -

VTR Color AFC

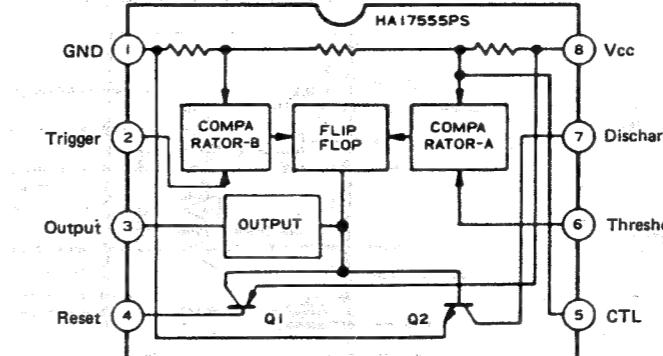


- HA11752 -

Preamp For FM Audio Signal

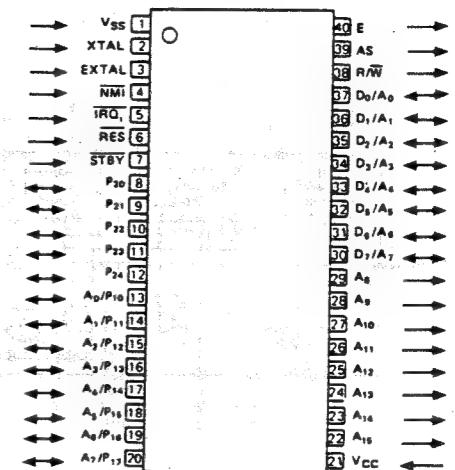


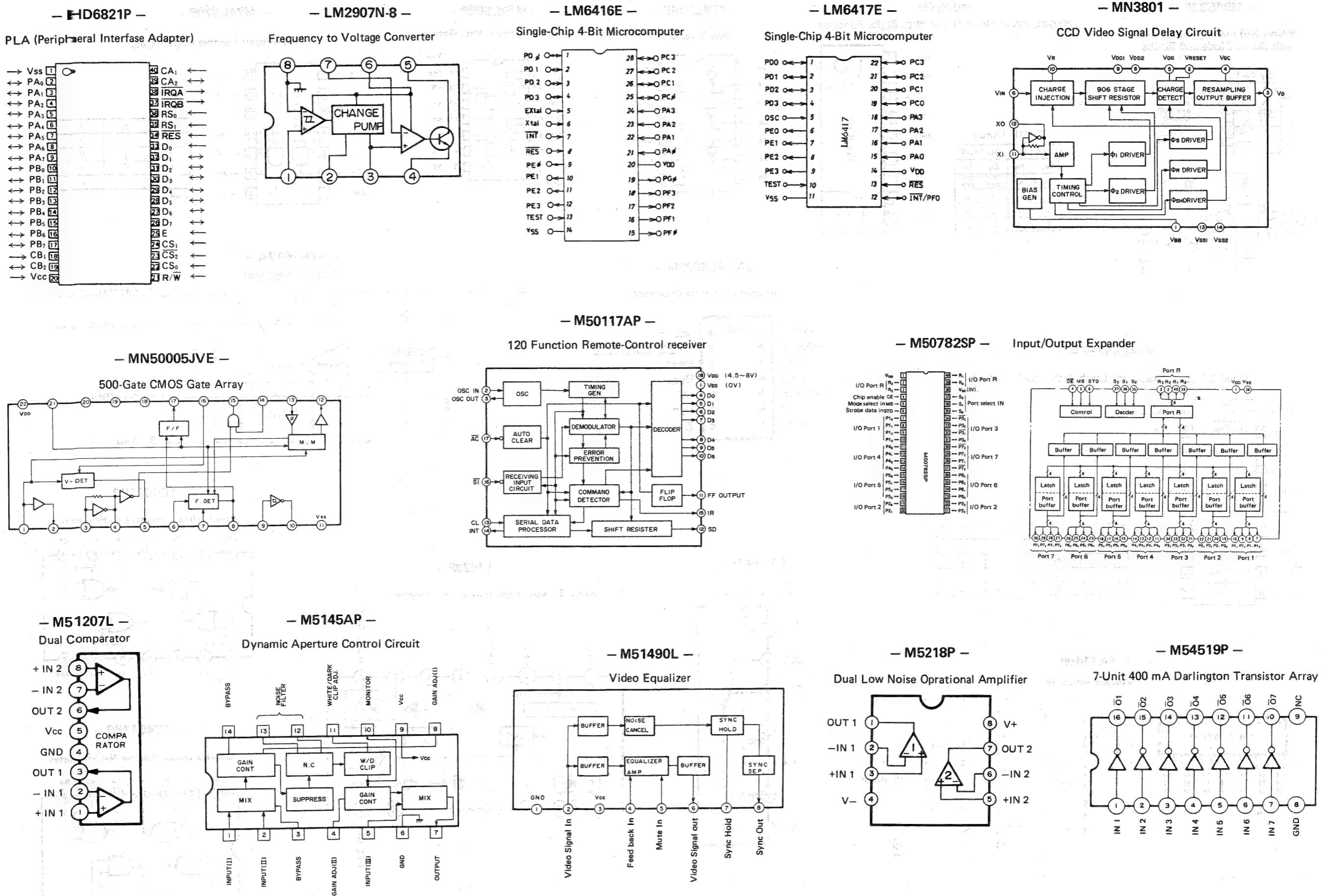
- HA17555PS -
Precision Timer

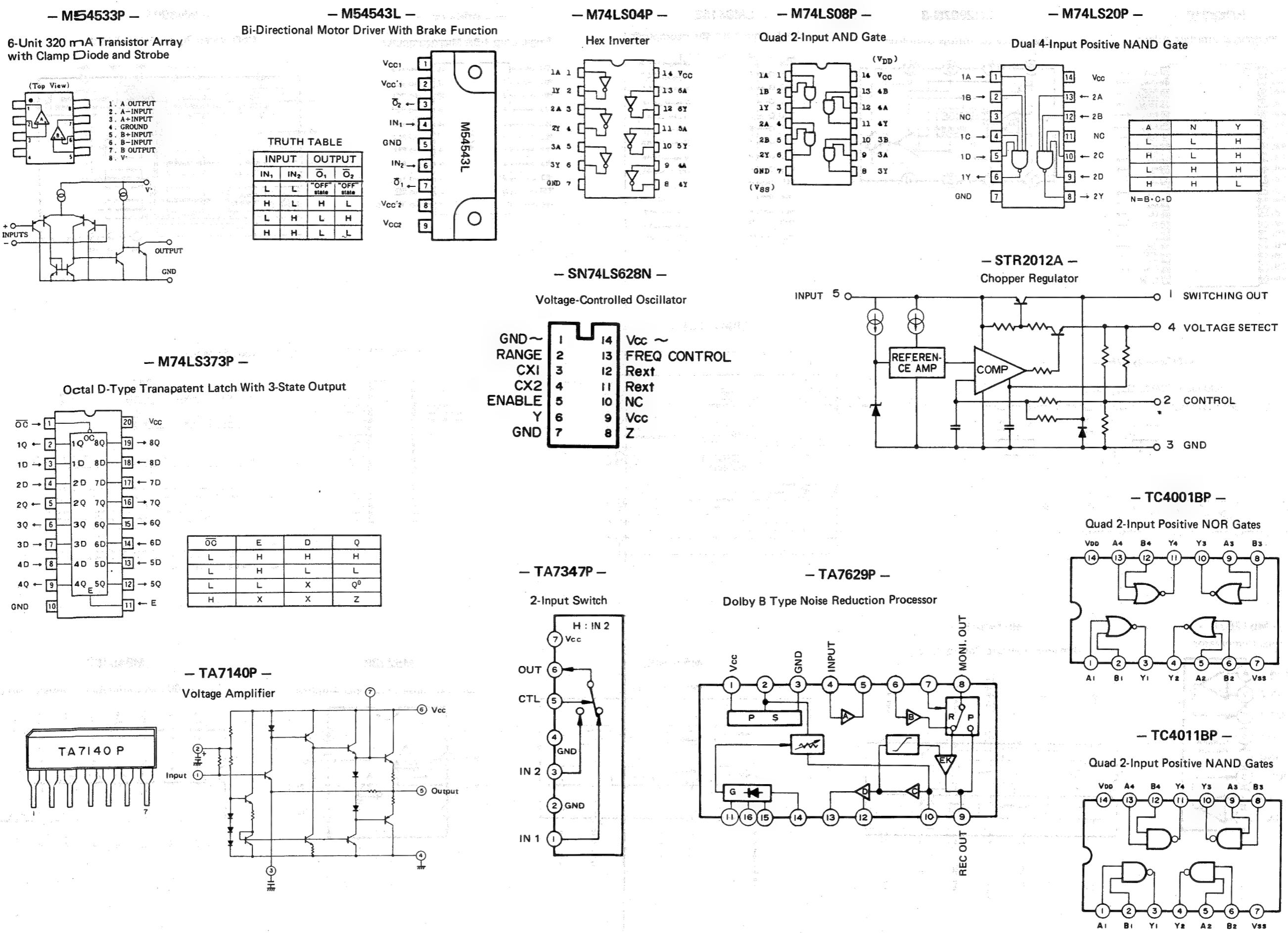


- HD6303RP -

MCU (Microcomputer Unit)

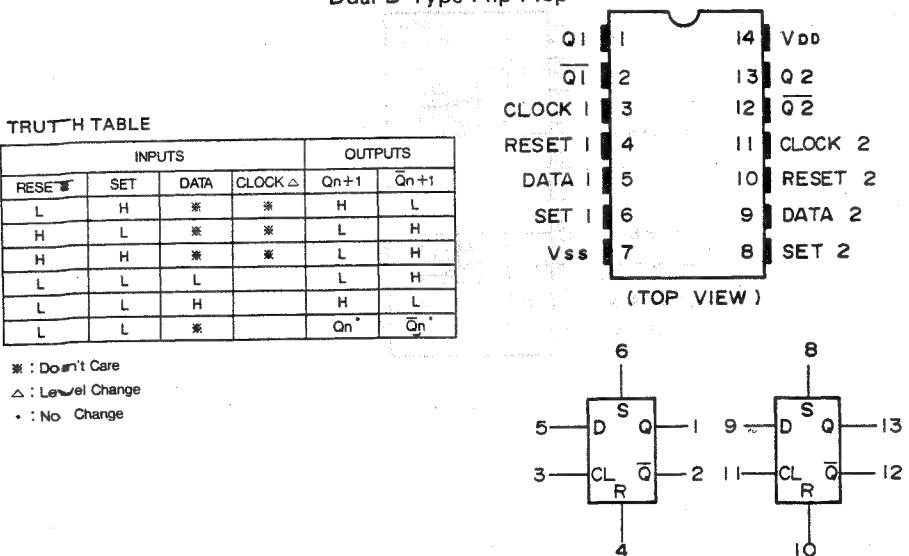






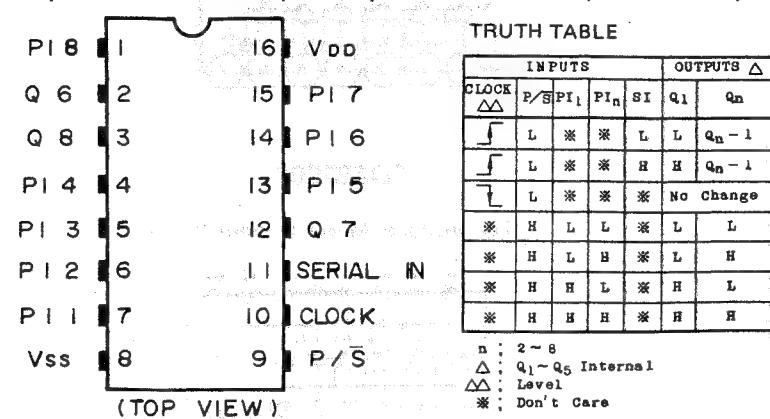
- TC4013BP -

Dual D-Type Flip Flop



- TC4021BP -

8-Stage Static Shift Register
(Asynchronous Parallel Input or Synchronous Serial Input/Serial Output)



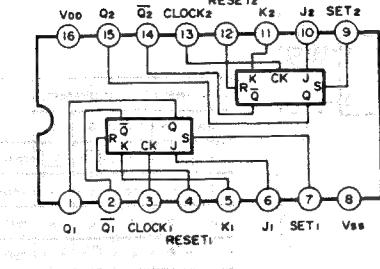
- TC4027BP -

Dual J-K Master-Slave Flip-Flop

TRUTH TABLE

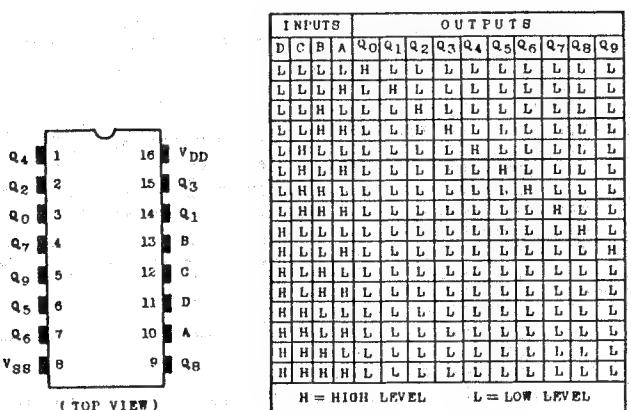
INPUTS				OUTPUTS		
CL	PR	J	K	CPΔ	Q _{n+1}	\bar{Q}_{n+1}
L	H	*	*	*	H	L
H	L	*	*	*	L	H
H	H	*	*	*	L	H
L	L	L	L		L	H
L	L	H	L		H	L
L	L	*	*	*	Q _n	\bar{Q}_n
L	L	*	*	*	\bar{Q}_n	Q _n

* : Don't Care
 Δ : Level Change
• : No Change
++ : Change



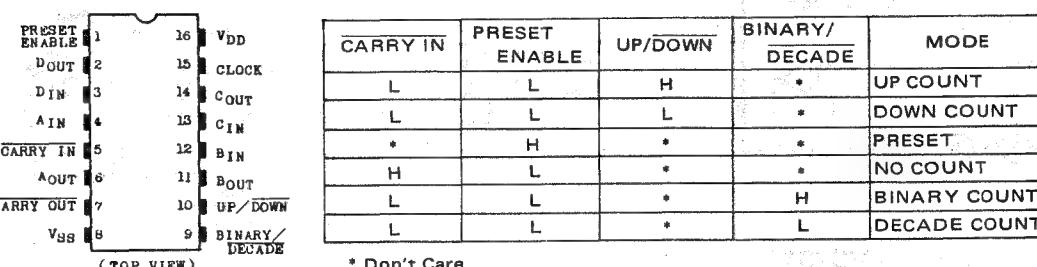
- TC4028BP/BF -

BCD-To-Decimal Decoder



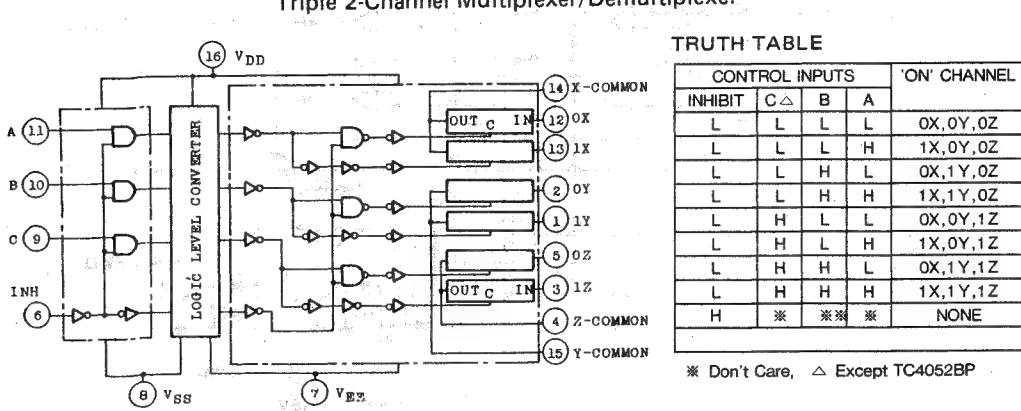
- TC4029BP -

Presetable UP/DOWN Counter



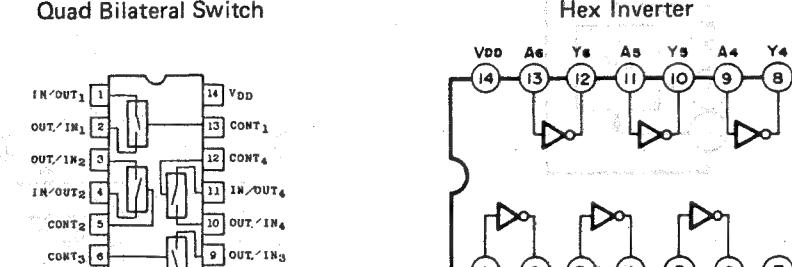
- TC4053BP -

Triple 2-Channel Multiplexer/Demultiplexer



- TC4066BP -

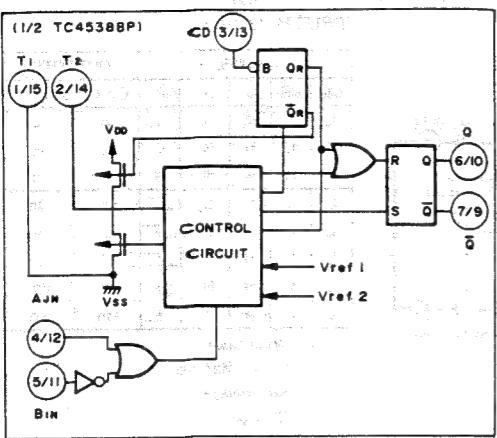
Quad Bilateral Switch



H : ON</

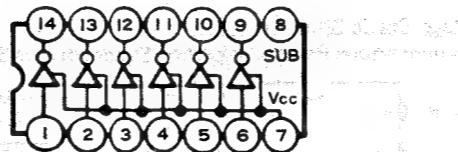
- TC4538BP -

Dual Precision Retriggerable/
Resettable Monostable Multivibrator



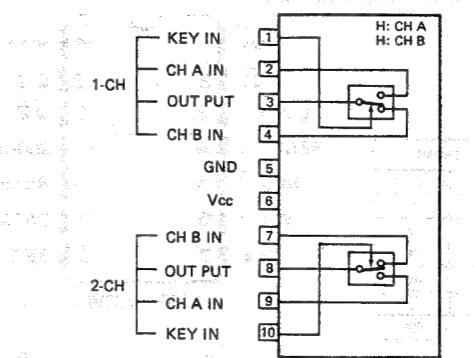
- TD62703P -

High Voltage Source Current Driver



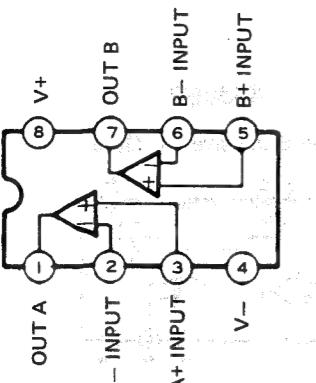
- TK15021 -

Analog Switch



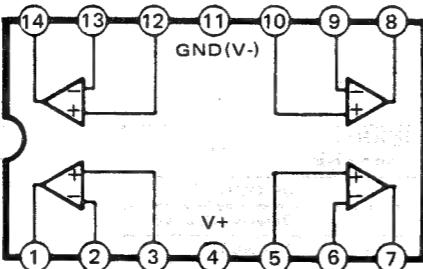
- UPC1458C -

Dual Operation Amplifier



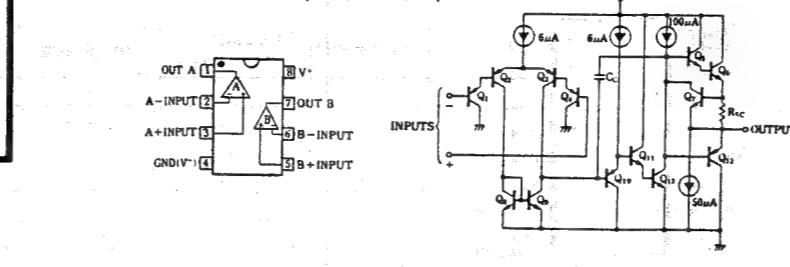
- UPC324C -

Quad Operational Amplifier



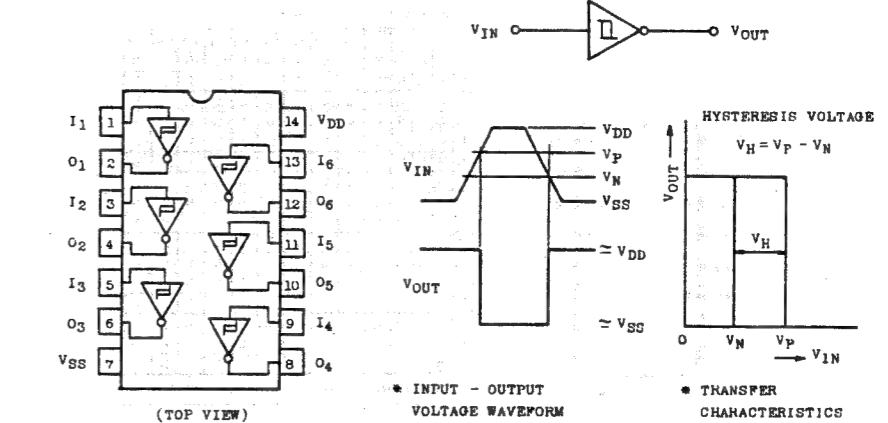
- UPC358C -

Dual General Purpose OP Amp.



- UPD4584BC -

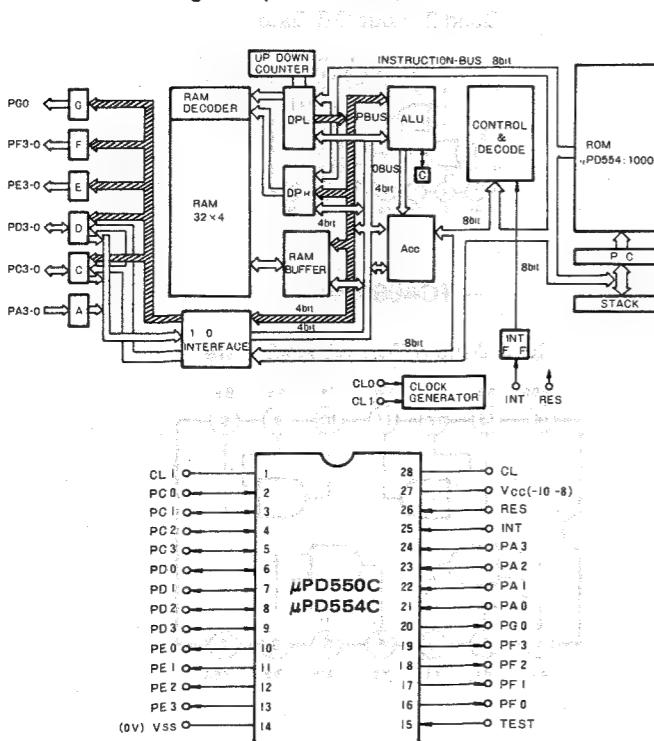
Hex Schmitt Trigger



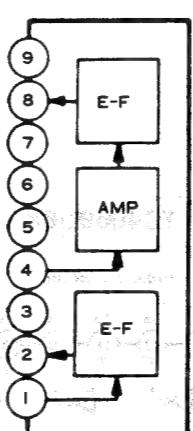
- UPD550C-055 -

- UPD554C-058 -

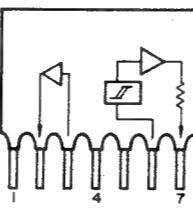
Single-Chip 4-Bit Microcomputer



- VC2011 -

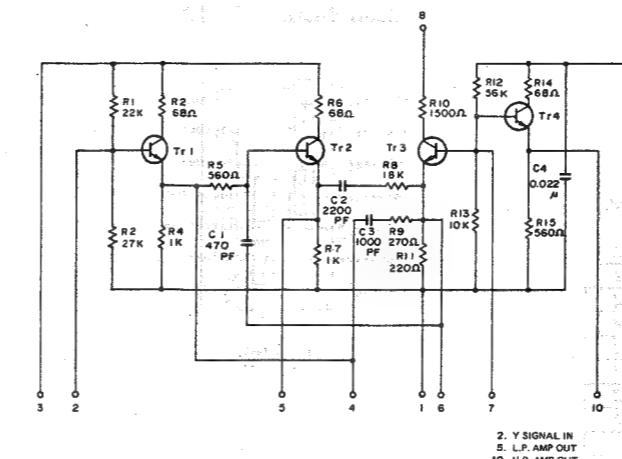


- 7VT06 -



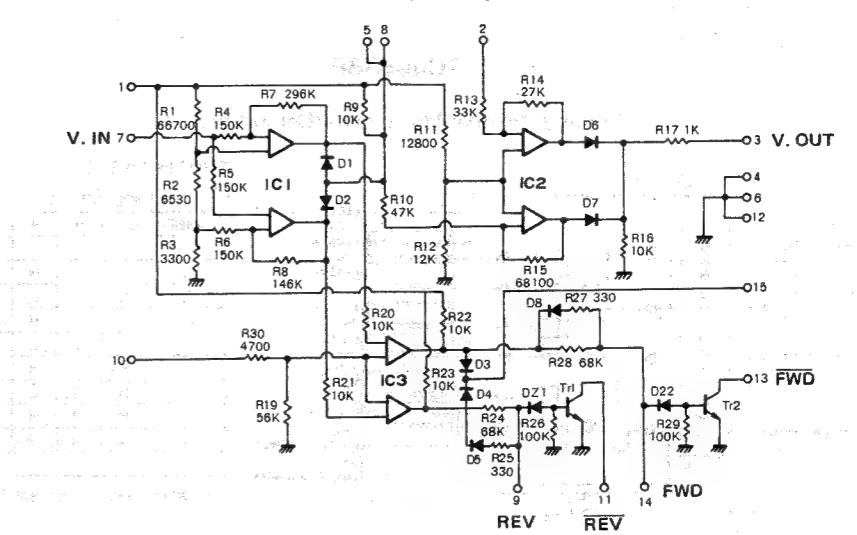
- 10VT12 -

For Noise Canceller Circuit



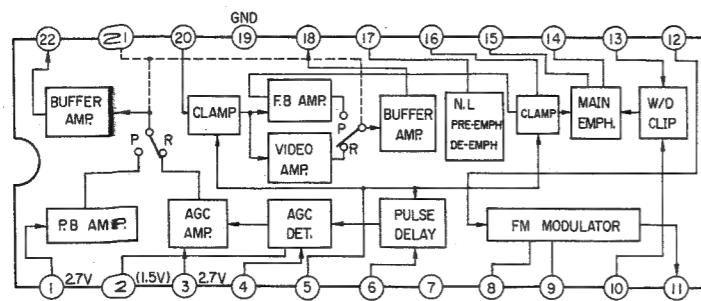
- 15VT01 -

VR Control Circuit



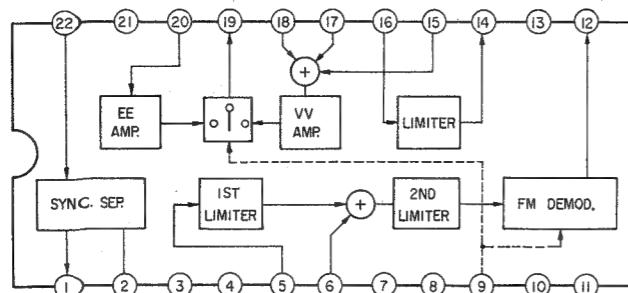
— AN6306 —

VTR Recording Video Signal Processing Circuits



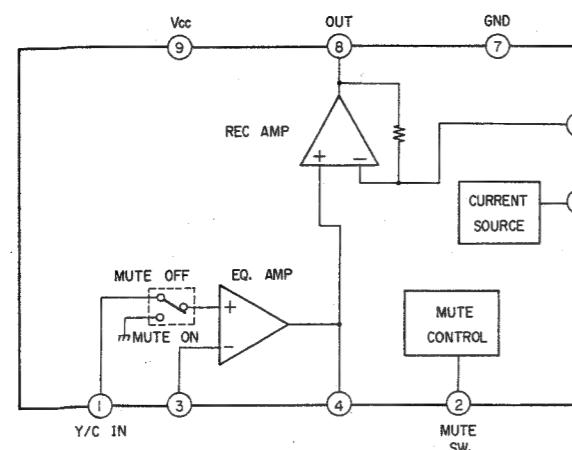
— AN6327 —

VTR Playback Video Signal Processing Circuits



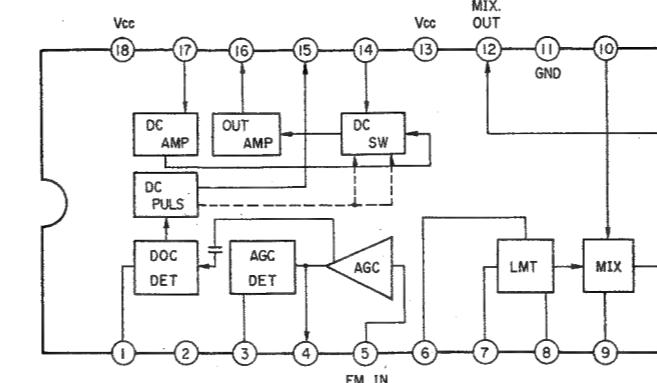
— AN6392 —

VTR Rec Amp



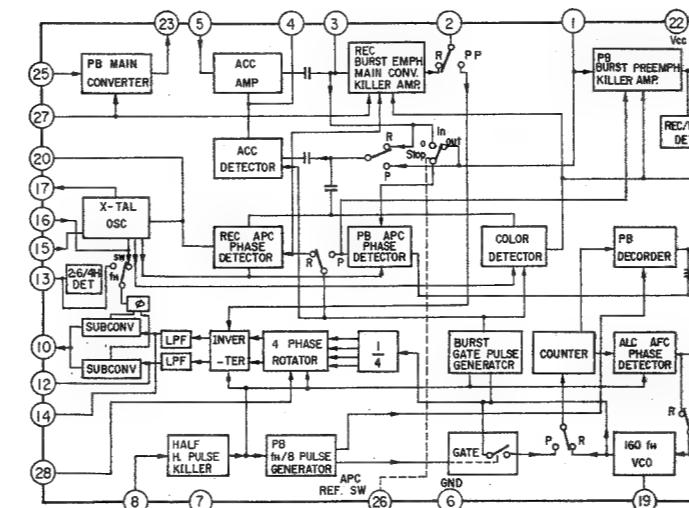
— AN6393 —

VTR Luminance Signal Processing Circuits



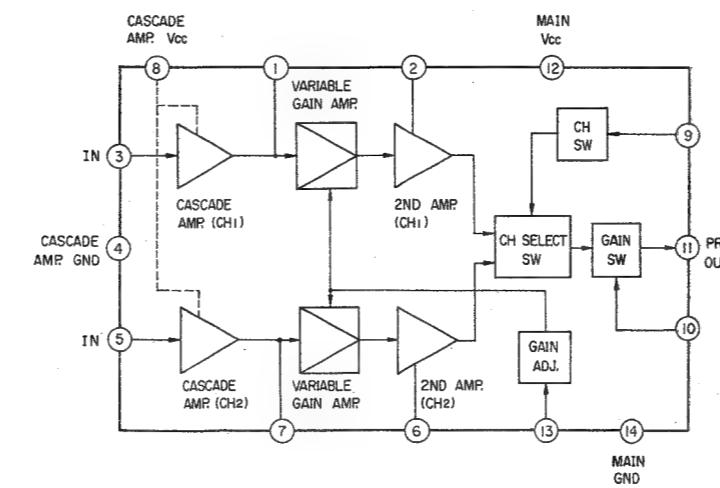
— HA11756 —

VTR Colour Signal Processing Circuits



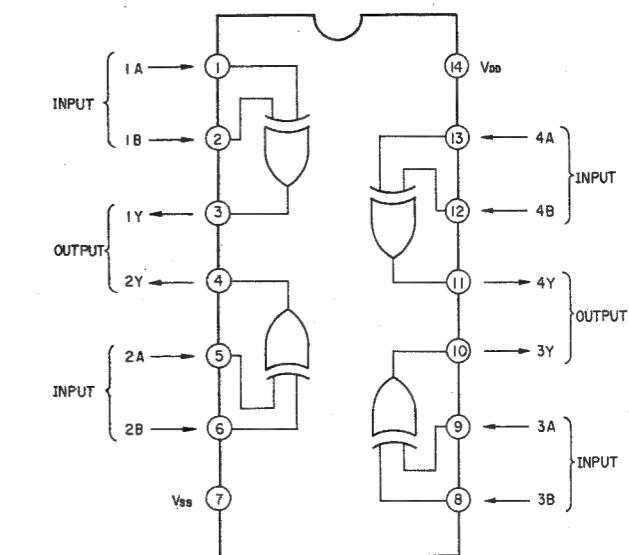
— HA11782 —

Variable Gain Amp



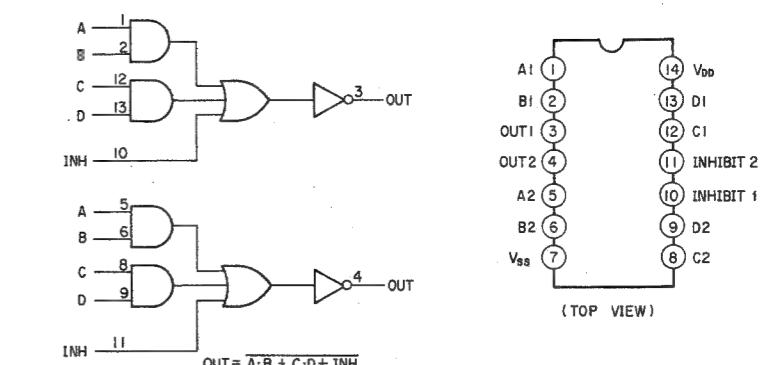
— M4030BP —

Quadruple Exclusive-or Gate



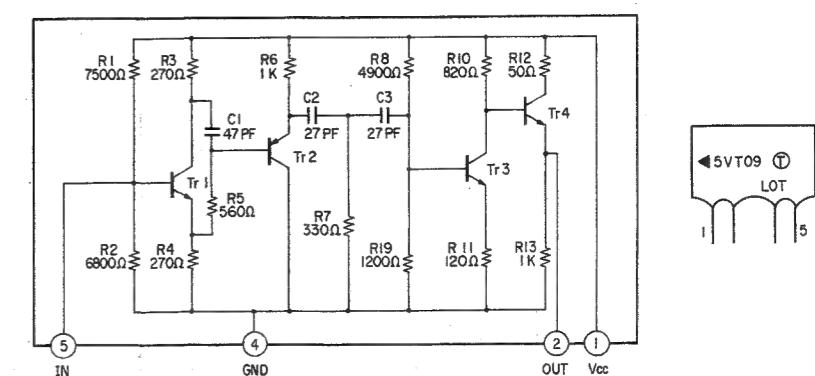
— TC4085BP —

Dual 2-Wide 2-Input and-or-invert Gate



— 5VT09 —

Hybrid Amp



SECTION 5

EXPLODED VIEWS AND PARTS LIST

SAFETY PRECAUTION

Parts identified by the  symbol are critical for safety.
Replace only with specified part numbers.

5.1 STANDARD PART NUMBER CODING

5.1.1 Screw coding	5-2
5.1.2 Fuse coding	5-3

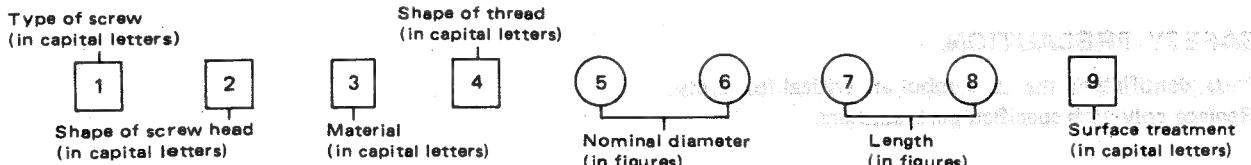
5.2 EXPLODED VIEWS AND PARTS LIST

5.2.1 Packing assembly	5-3
5.2.2 Cabinet assembly	5-4
5.2.3 Front panel assembly	5-5
5.2.4 Chassis assembly	5-6
5.2.5 Mounting bracket assembly	5-8
5.2.6 Rear frame assembly	5-10
5.2.7 Main-deck (1) assembly	5-12
5.2.8 Main-deck (2) assembly	5-14
5.2.9 Sub deck assembly	5-16
5.2.10 Drum assembly	5-18
5.2.11 Cassette housing assembly	5-20

5.1 STANDARD PART NUMBER CODING

5.1.1 Screw coding

Standard screw part numbers are as follows.



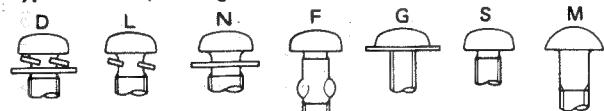
Type of screw (first digit)

- S Normal screws
- D Assembled machine screws (with plain and spring washers)
- L " (with spring washer)
- N " (with plain washer)
- F Feather screws
- G Washer head tapping screws
- M Wood screws

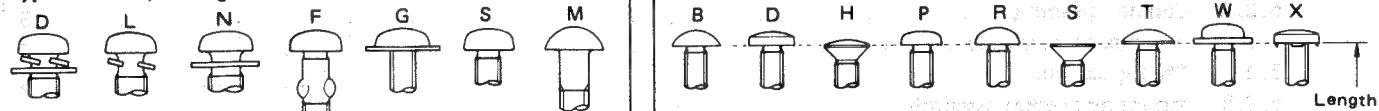
Shape of screw head (second digit)

- B Brazier head
- D Binding head
- H Oval countersunk head
- P Pan head
- R Round head
- S Flat head
- T Truss head
- W Washer head (machine screws)
- X Toothed head

-Type of screw (first digit)-



-Shape of screw head (second digit)-



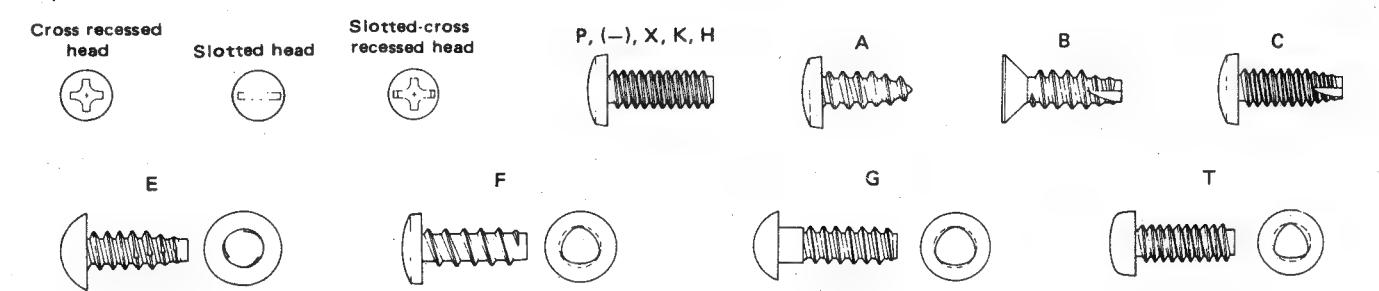
Material (third digit)

- | | |
|-------------------|-----------------|
| S Steel | N Nickel silver |
| E Stainless steel | Y Cast brass |
| C Cast iron | A Aluminum |
| U Copper | Z Zinc alloy |
| B Brass | K Polycarbonate |
| P Phosphor bronze | |

Shape of thread (fourth digit)

- P Cross recessed head screws
- (-) Slotted head machine screws
- X Slotted-cross recessed head machine screws
- K Cross recessed head machine screws for precision equipment (type 1)
- H " (type 2)
- A Cross recessed head tapping screws (type 1)
- B " (type 2)
- C " (type 3)
- E Cross recessed head special tapping screws (brand : evertight)
- F " (brand : P-tight)
- T " (brand : taptight)
- G "

-Shape of thread (fourth digit)-



Nominal diameter (fifth and sixth digits)

The fifth and sixth digits are numbers indicating a nominal diameter or dimension. If the dimension exceeds 10 mm, three digits are used. The number indicates a nominal diameter or dimension, given in millimeters, multiplied by ten.

Surface treatment (ninth digit)

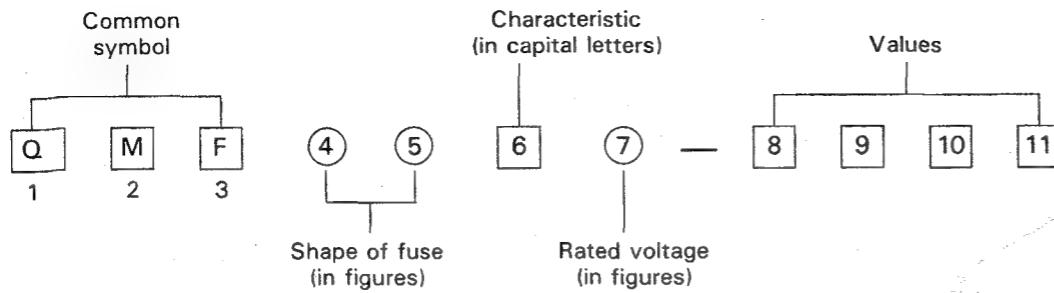
- Z Dichromate treatment after galvanizing (MFZn II-C)
- N Nickel plating (MFNi II, MFNi I)
- R Chromium plating (MBCr II, MBCr I)
- G Silver plating (SP4)
- B Black coating after plating
- F Blackening of iron (FB)
- M Blackening after galvanizing
- K Pickling of brass (PF2)
- P Phosphate treatment
- W Uni-chrome plating
- L Coating with transparent paint
- A Coloring red after galvanizing (MFZn II-C)
- C Coloring blue after galvanizing (MFZn II-C)
- T Coloring green after galvanizing (MFZn II-C)
- V Coloring purple after galvanizing (MFZn II-C)

Length (seventh and eighth digits)

The seventh and eighth digits are numbers indicating length in millimeters. The preceding figure is zero when the dimension is smaller than 10 mm. For machine screws used in precision equipment whose length is given in units of 0.1 mm, the number indicates ten times the size of their length.

5.1.2 Fuse coding

Standard fuse part numbers are as follows.



Shape of fuse (fourth and fifth digits)

51	φ5.2 × 20 mm
60	φ6.4 × 30 mm
61	φ6.35 × 31.8 mm
63	φ6.4 × 30 mm with lead wires
66	φ6.35 × 31.8 mm with lead wires
00	Special type

Rated voltage (seventh digit)

1	AC125 V
2	AC250 V
3	0.1–1 A : AC250 V 1.25–6.3 A : AC125 V

Values (eighth-tenth or eleventh digits)

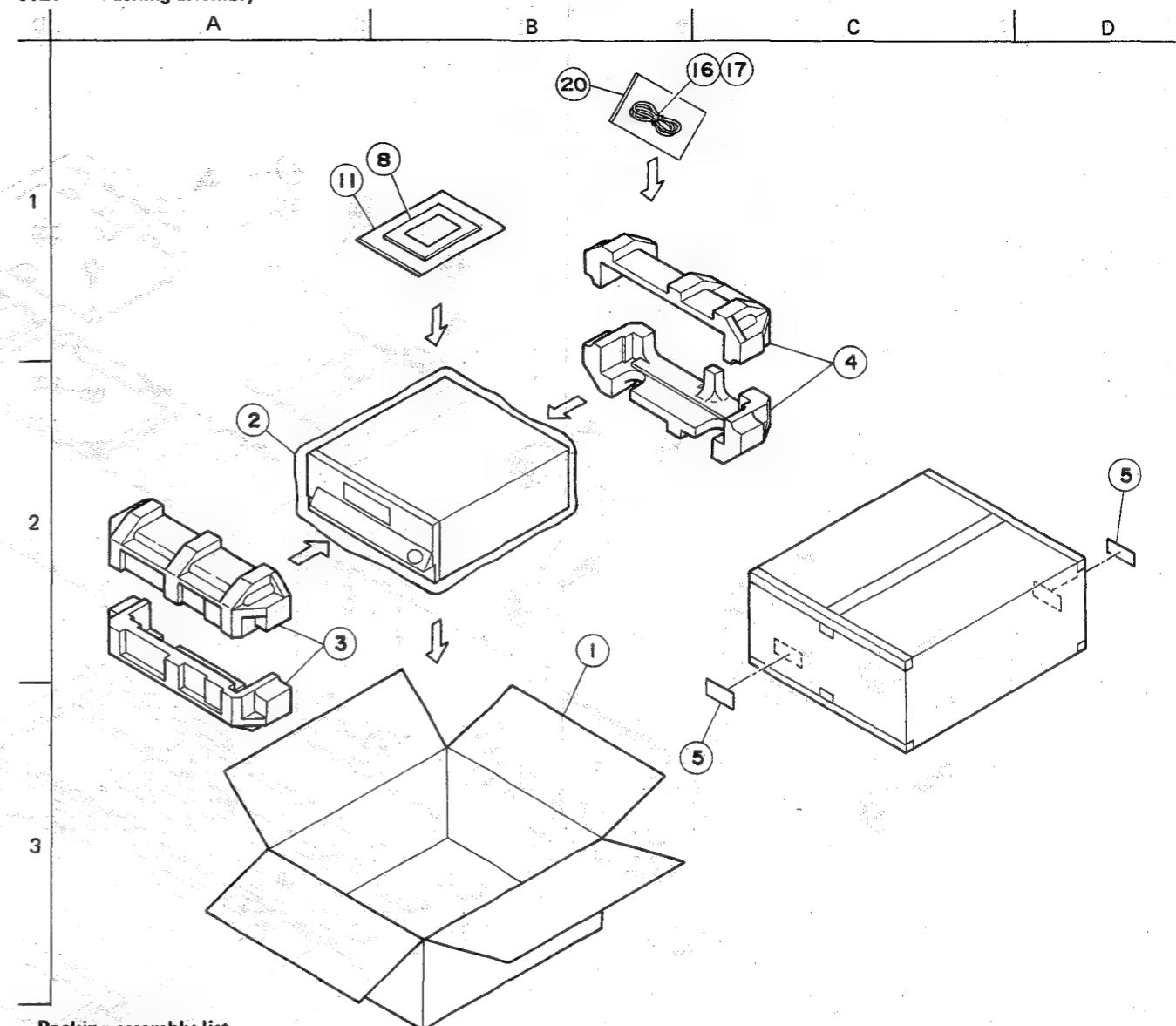
example:	
R63	..... 0.63 A
1R0	..... 1.0 A
2R5	..... 2.5 A
100	..... 10 A
R315	..... 0.315 A
1R25	..... 1.25 A

Characteristics (sixth digit)

Symbol	Fusing Current	Fusing Time	Remarks
A	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
B	210 %	Within 30 min.	Regular fusible type (for SEMKO, Europe)
	275 %	0.05 – 2 sec.	
	400 %	0.01 – 0.3 sec.	
C	135 %	Within 1 hr.	Regular fusible type (for UL, Japan)
	200 %	Within 2 min.	
E	210 %	Within 2 min.	Anti-rush type (for Europe)
	275 %	0.6 – 10 sec.	
	400 %	0.15 – 3 sec.	
	1000 %	0.02 – 0.3 sec.	
J	135 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
M	135 %	Within 1 hr.	Regular fusible type (for UL)
	200 %	Within 2 min.	
R	160 %	Within 1 hr.	Regular fusible type
	200 %	Within 2 min.	
S	160 %	Within 1 hr.	Anti-rush type
	200 %	Within 2 min.	
	700 % – 2000 %	Within 0.01 sec.	
U	135 %	Within 1 hr.	Anti-rush type (for UL)
	200 %	Within 2 min.	
	800 % – 2000 %	Within 0.01 sec.	

5.2 EXPLODED VIEWS AND PARTS LIST

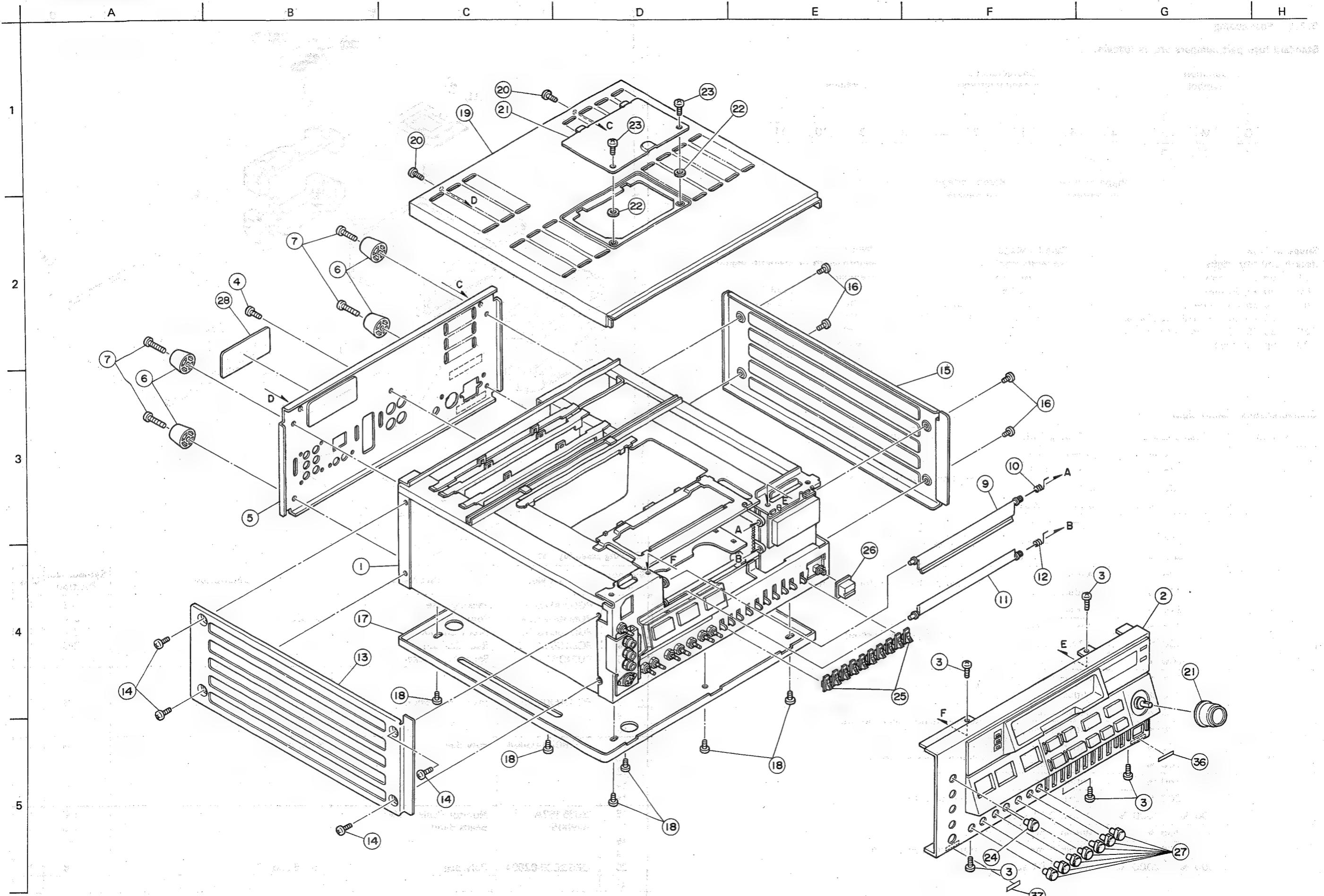
5.2.1 Packing assembly



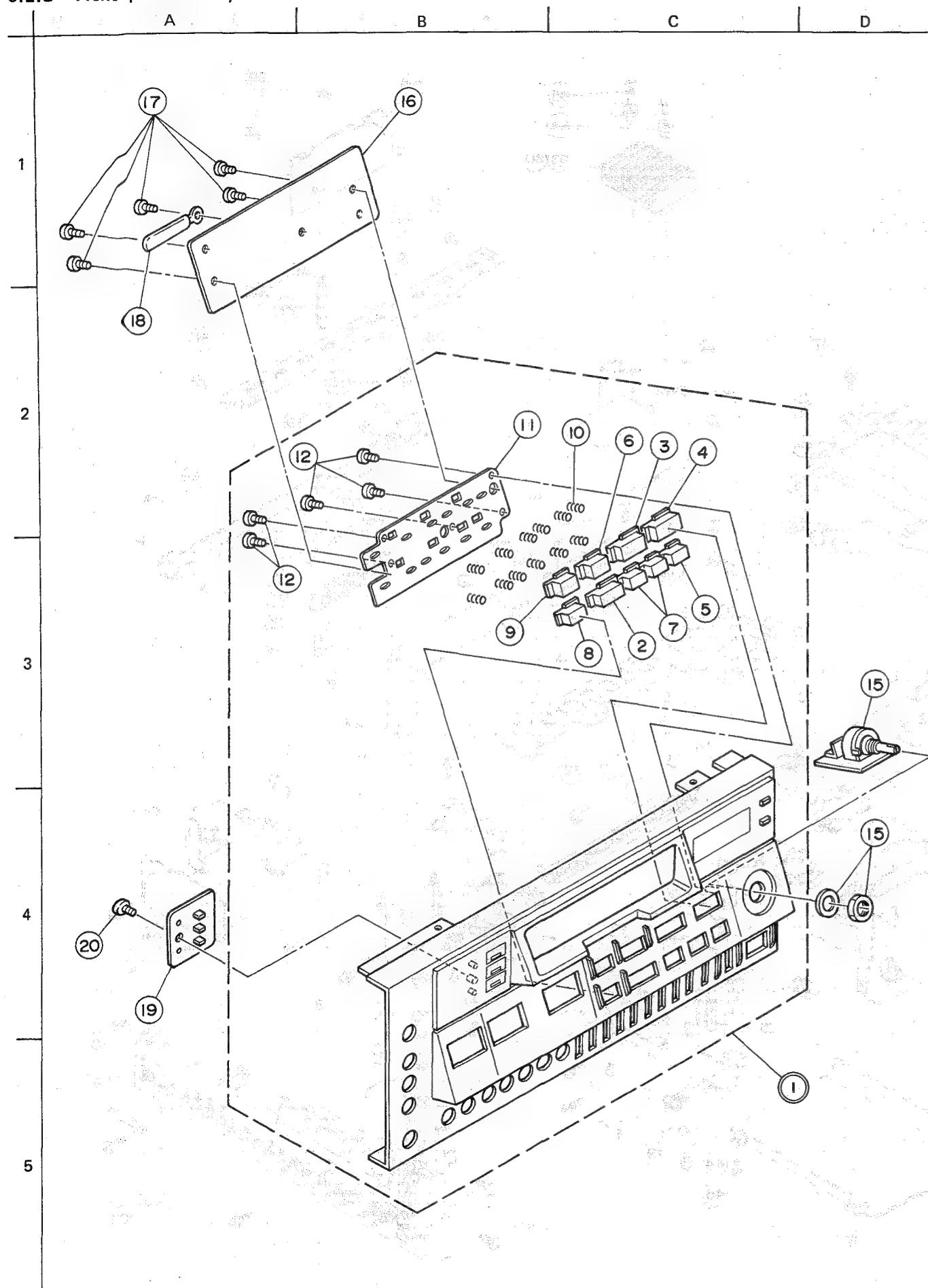
Packing assembly list

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	PGD20025-21	Packing Case	for Set	2-B	1
2	PUM30021-24	Poly Bag		2-A	1
3	PGD10013-1-2	Front Cushion		2-A	1
4	PGD10014-1-2	Rear Cushion		2-C	1
5	PUP40619	Serial No. Sticker		2-D	2
6	—	—	Instruction Book	—	—
7	—	—		—	—
8	PGD30002-85	—		1-B	1
9	—	—		—	—
10	—	—		—	—
11	QPGB024-03404	Poly Bag	for 8, 9	1-A	1
12	—	—		—	—
13	—	—		—	—
14	—	—		—	—
15	—	—		—	—
16	GU35252A	Monitor Cable Ass'y	for 16 and 17	1-C	1
17	A49005	Beads Band		1-C	1
18	—	—		—	—
19	—	—		—	—
20	QPGB020-02804	Poly Bag		1-B	1
21	—	—		—	—

5.2.2 Cabinet assembly



5.2.3 Front panel assembly



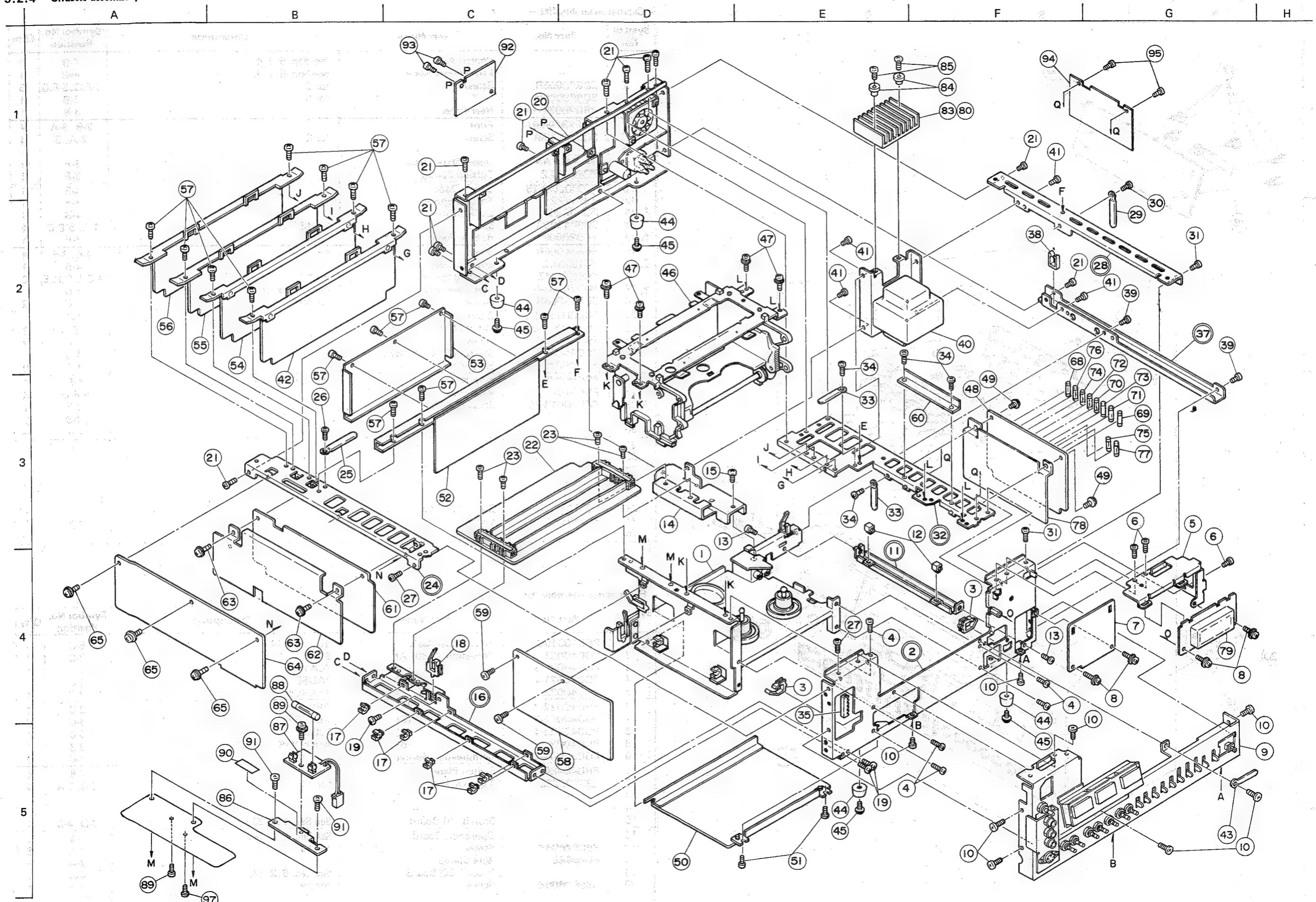
— Cabinet assembly list —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	—	Chassis Ass'y.	See Sec. 5.2.4.	4-B	1
2	—	Front Panel Ass'y	See Sec. 5.2.3.	4-G	1
3	SDBP3006R	Screw	for 2	4-F,G,5-F,G	5
4	SDBP3006M	"	for 5	2-B	1
5	PRD20029-01-01	Rear Panel		3-B	1
6	QZF2319-001	Foot Screw	for 6	2-B, 3-A	4
7	SDBP4018M			2-A, B	4
8	—			—	—
9	PQ30107AA-1	Upper Door Ass'y	for 13	3-F	1
10	PQ40104-2	Torsion Spring		3-F	1
11	PQ30020-2-15	Lower Door		4-F	1
12	PQ40472	Torsion Spring		4-F	1
13	PGD20007	L. Side Panel		4-B	1
14	SDBP4006R	Screw	for 13	4-A, 5-B,C	4
15	PGD20008	R. Side Panel		3-F	1
16	SDBP4006R	Screw	for 15	2-E, 3-F	4
17	PU10364-2	Bottom Cover		4-B	1
18	SBST3006Z	Tapping Screw		4-C, 5-C,D,E	6
19	PGD20034A-1	Top Cover Ass'y	for 17	1-C	1
20	SDBP3006R	Screw	Incl. 21 to 23	1-C	2
21	PGD30155-1-2	Cover	for 19	1-C	1
22	PUM30017-6	Slit Washer		1-E, 2-D	2
23	SDBP3006R	Screw		1-D	2
24	PGD40035A-1	Search VR Knob Ass'y		4-G	1
25	PGD40023	Slide Knob		4-E	10
26	PGD40026	Push Knob	for POWER SW	4-E	1
27	PU52482	VR Knob		5-F,G	8
28	PGD30018-15	Serial No. Plate		2-B	1
29	—			2-B	2
30	—			—	—
31	—			—	—
32	—			—	—
33	—			—	—
34	—			—	—
35	—			—	—
36	PQ4111-1-4	Serial No. Plate		5-F	1
37	PU54559-2	Label		—	—
38	—			—	—

— Front panel assembly list —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	PRD10010C	Front Panel Ass'y.	Incl. 2 to 14	5-C	1
2	PGD40021-2	Operation Knob (A)	STOP	3-C	1
3	PGD40021-3	" (A)	PLAY	2-C	1
4	PGD40021-4	" (A)	PAUSE	2-C	1
5	PGD40022	" (B)	SEARCH	3-C	1
6	PGD40022-2	" (B)	REC	2-C	1
7	PGD40022-3	" (B)	REW/FF	3-C	2
8	PGD40022-4	" (B)	EJECT	3-C	1
9	PGD40022-5	" (B)	AUD DUB	3-B	1
10	PGD30004-3	Compression Spring		1-C	12
11	PRD40480	Switch Plate		2-B	1
12	SBSF2605Z	Tapping Screw	for 11	2-B, 3-A	4
13	—			—	—
14	—			—	—
15	—	Search VR Board	See Sec. 6.2.23.	3-D, 4-D	1
16	—	Operation Board	See Sec. 6.2.14.	1-B	1
17	SBSF2606Z	Screw	for 16	1-A	5
18	PU49485	Wire Clamp		2-A	1
19	—	Front LED Board	See Sec. 6.2.24.	4-A	1
20	SBSF2606Z	Screw	for 19	4-A	1

5.2.4 Chassis assembly

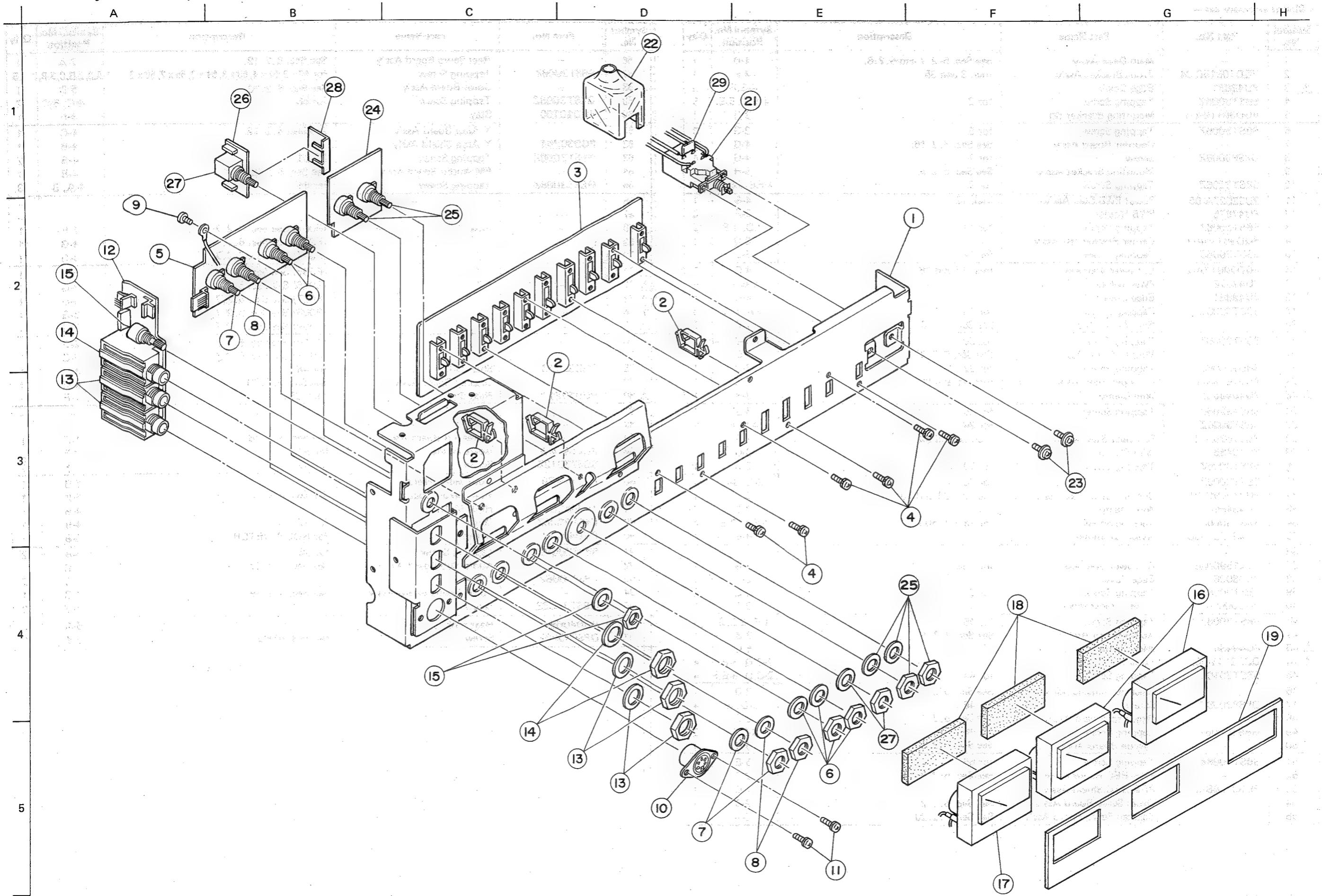


— Chassis assembly list —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	—	Main Deck Ass'y	See Sec. 5.2.7 and 5.2.8.	4-D	1
2	PGD10015C-04	Front Bracket Ass'y	Incl. 3 and 35	4-E	1
3	PU49881	Edge Cover		4-E,F	2
4	SBST3006Z	Tapping Screw	for 2	4-E,F, 5-E	5
5	PGD30110-1-1	Mounting Bracket (2)		3-G	1
6	SBST3006Z	Tapping Screw	for 5	3-G	3
7	—	Counter Board Ass'y	See Sec. 6.2.16.	4-G	1
8	DPSP3008Z	Screw	for 7	4-G	4
9	—	Mounting Bracket Ass'y	See Sec. 5.2.5.	5-H	1
10	SBST3006Z	Tapping Screw	for 9	4-F,G, 5-E,F,G	8
11	PU33027A-06	Power PWB Stay Ass'y	Incl. 12	4-E	1
12	PU47876	PWB Holder		3-F	2
13	SBST3006Z	Tapping Screw	for 11	3-D, 4-F	2
14	PGD30115A-1	Center Bracker (B) Ass'y		3-D	1
15	SBST3006Z	Tapping Screw	for 14	3-D	1
16	PGD20017A-2	L. Lower Stay Ass'y	Incl. 17 and 18	4-C	1
17	PU47876	PWB Holder		5-B, C	6
18	PU49881	Edge Cover		4-C	1
19	SBST3006Z	Tapping Screw	for 16	5-B, 5-E	3
20	—	Rear Frame Ass'y	See Sec. 5.2.6.	1-C	1
21	SBST3006Z	Tapping Screw	for 20	1-C,D,F, 2-C,F, 3-B	11
22	—	Mother Board Ass'y	See Sec. 6.2.22.	3-C	1
23	SBST3006Z	Tapping Screw	for 22	3-C	4
24	PU21514B-4	L. Upper Stay Ass'y	Incl. 25 and 26	4-C	1
25	PU49485-2	Wire Clamp		3-B	1
26	SBST3006Z	Tapping Screw	for 25	3-B	1
27	SBST3006Z	"	for 24	4-C, E	2
28	PU21586A-2	R. Upper Stay Ass'y	Incl. 29 and 30	2-G	1
29	PU49485	Wire Clamp		2-G	1
30	SBST3006Z	Tapping Screw	for 29	2-G	1
31	SBST3006Z	"	for 28	2-G, 3-F	2
32	PU21509C-10	Center Upper Stay Ass'y	Incl. 33, 34 and 60	3-F	1
33	PU49485-2	Wire Clamp		3-E	2
34	SBST3006Z	Tapping Screw	for 33 x 2, 60 x 2	2-E,F, 3-E	4
35	PU43172-9-50	Nylon Grommet		4-E	1
36	—	—		—	—
37	PU21590A-6	R. Lower Stay Ass'y	Incl. 38	2-G	1
38	PU48086	Edge Cover		2-F	1
39	SBST3006Z	Tapping Screw	for 37	2-G	2
40	PGZ00014	Power Transformer		2-F	1
41	SBST3008Z	Tapping Screw	for 40	1-F, 2-E,G	4
42	—	Audio Board Ass'y	See Sec. 6.2.1.	3-B	1
43	PU49485	Wire Clamp		5-G	1
44	QZF2115-002	Foot		2-C,D, 5-E,F	4
45	SBST3010Z	Tapping Screw	for 44	2-C,D, 5-E,F	4
46	—	Cassette Housing Ass'y	See Sec. 5.2.11.	2-D	1
47	DPSP3008Z	Screw	for 46	2-D, E	4
48	—	Regulator Board Ass'y	See Sec. 6.2.7.	3-F	1
49	GBST3008Z	Tapping Screw	for 48	3-F,G	2
50	—	Syscon Board Ass'y	See Sec. 6.2.8.	5-D	1
51	SBST3008Z	Tapping Screw	for 50	5-E	2
52	—	PRE/REC Board Ass'y	See Sec. 6.2.9.	3-C	1
53	PU33706B-2	PRE/REC Shield Ass'y		2-C	1
54	—	Drum Servo Board Ass'y	See Sec. 6.2.21.	2-B	1
55	—	Capstan Servo Board Ass'y	See Sec. 6.2.20.	2-A	1

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
56	—	Reel Servo Board Ass'y	See Sec. 6.2.19.	2-A	1
57	SBST3006Z	Tapping Screw	for 42 x 2, 52 x 4, 53 x 3, 54 x 2, 55 x 2, 56 x 2	1-A,B,2-B,C,3-B,C	15
58	—	Color Board Ass'y	See Sec. 6.2.10.	5-D	1
59	GBST3008Z	Tapping Screw	for 58	4-C, 5-C	2
60	PGD40100	Stay		3-F	1
61	—	Y Amp Board Ass'y	See Sec. 6.2.12.	4-C	1
62	PGD30364	Y Amp Shield Ass'y		4-B	1
63	GBST3008Z	Tapping Screw	for 61	4-B	2
64	—	FM Audio Board Ass'y	See Sec. 6.2.2.	4-B	1
65	GBST3008Z	Tapping Screw	for 64	4-A, B	3
66	—	—		—	—
67	—	—		—	—
68	—	Fuse	(F002) See Sec. 6.2.7.	2-F	1
69	—	"	(F003) See Sec. 6.2.7.	3-G	1
70	—	"	(F004) See Sec. 6.2.7.	3-G	1
71	—	"	(F005) See Sec. 6.2.7.	3-G	1
72	—	"	(F006) See Sec. 6.2.7.	2-G	1
73	—	"	(F007) See Sec. 6.2.7.	3-G	1
74	—	"	(F008) See Sec. 6.2.7.	3-G	1
75	—	"	(F009) See Sec. 6.2.7.	3-G	1
76	—	"	(F010) See Sec. 6.2.7.	2-G	1
77	—	"	(F011) See Sec. 6.2.7.	3-G	1
78	PGD30156	Shield Plate	for 48	3-F	1
79	—	Display Board Ass'y	See Sec. 6.2.30.	4-G	1
80	PGD40211	Heat Sink	Incl. 83	1-F	1
81	—	—		—	—
82	—	—		—	—
83	—	Power TR Board Ass'y	See Sec. 6.2.36.	1-F	1
84	PU41624-6	Isolat Washer	for 83	2-F	2
85	SDSP3012Z	Screw	for 80	1-F	2
86	PRD40479	Hour Meter Holder		5-B	1
87	—	Hour Meter Board	See Sec. 6.2.35.	5-B	1
88	PU44629	Hour Meter		4-B	1
89	DPSP3006Z	Screw	for 87	4-B	1
90	PGD40417	Sticker	for HOUR METER	5-B	1
91	SBST3008Z	Tapping Screw	for 86	5-B	2
92	—	Audio Sub Board Ass'y	See Sec. 6.2.37.	1-C	1
93	LPSP3008Z	Screw		1-C	2
94	—	Color Frame Board Ass'y	See Sec. 6.2.39.	1-G	1
95	GBST3008Z	Screw		1-G	2
96	PGD40684	Heat Sink		5-A	1
97	DPSP3008Z	Screw	for 2SB761PQ	5-B	1

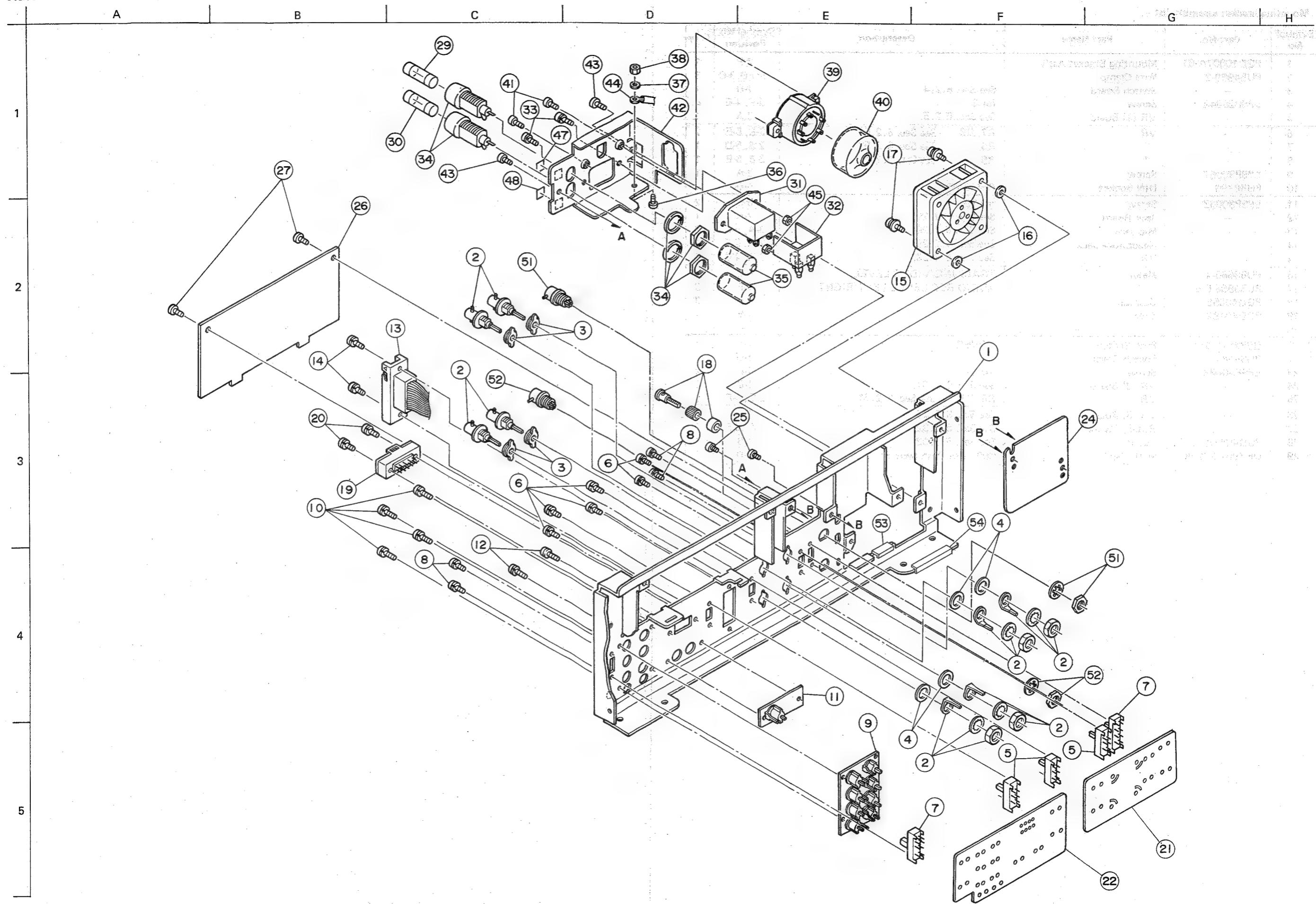
5.2.5 Mounting bracket assembly



— Mounting bracket assembly list —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	PG D10007A-01	Mounting Bracket Ass'y		2-F	1
2	PU 54969-2	Wire Clamp		2-C,D,3-C	3
3	—	Switch Board		1-D	1
4	LPS P2604Z	Screw		3-F, 4-E	6
5	—	VR (1) Board		2-A	1
6	—	VR	R7, R9 See Sec. 6.2.5.	2-B, 5-E	2
7	—	"	R5 See Sec. 6.2.5.	2-B, 5-D	1
8	—	"	R6 See Sec. 6.2.5.	2-B, 5-E	1
9	LPS P3006Z	Screw		2-A	1
10	PU 50793	DIN Socket	REMOTE	5-D	1
11	LPS P3006Z	Screw	for 10	5-E	2
12	—	Jack Board	See Sec. 6.2.29.	2-A	1
13	—	Mic Jack	See Sec. 6.2.29.	3-A, 5-D	2
14	—	Headphone Jack	See Sec. 6.2.29.	2-A, 5-C	1
15	—	VR	See Sec. 6.2.29.	2-A, 4-C	1
16	PU 53866-4	Meter	TRACKING/VIDEO LEVEL	4-G	1
17	PU 53866-5-5	"	AUDIO REC LEVEL LEFT/RIGHT	5-F	2
18	PG D40056	Cushion		4-F	3
19	PR D40482	Sheet		4-H	1
20	—	—		—	—
△ 21	QSP2111-011	Push Switch	POWER	1-E	1
△ 22	PU 54681	Switch Cover		1-D	1
23	LPS P3008Z	Screw	for 21	3-F	2
24	—	VR (2) Board	See Sec. 6.2.31.	1-B	1
25	—	VR	R8, R10 See Sec. 6.2.31.	2-C, 4-F	2
26	—	VR (3) Board	See Sec. 6.2.32.	1-B	1
27	—	Rotary Switch	See Sec. 6.2.32.	1-A, 5-E	1
28	PG D40419	Guard	See Sec. 6.2.32.	1-B	1
△ 29	QF Z9022-223M	M.M. Cap	C001 (for Push Switch)	1-D	1

5.2.6 Rear frame assembly



— Rear frame assembly list —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	PR D10015-01-02	Rear Bracket		2-F	1
2	PU 51213	BNC Connector		2-C, 4-F, 5-F	4
3	PU 48611	Ring		2-D, 3-C	4
4	QO-3093-439	Washer		3-F, 5-E	4
5	PG Z00016	Slide Switch	SW2, SW3, SW4	5-F	3
6	LPS2604Z	Screw	for 5	3-C, D	6
7	PG Z00017	Slide Switch	SW1, SW5	4-G, 5-F	2
8	LPS2604Z	Screw	for 7	3-D, 4-C	4
9	PG Z00413	8-pin Jack Ass'y	AUDIO IN/OUT	4-E	1
10	LPS2606Z	Screw	for 9	3-B	4
11	PG Z00414	1-pin Jack Ass'y	MONITOR OUT	4-E	1
12	LPS2606Z	Screw	for 11	3-C	2
13	PU 44246-5	45-pin Connector	REMOTE	2-C	1
14	LPS2610Z	Screw	for 13	2-B	2
△ 15	PG Z00403	Fan Motor		2-E	1
16	PG D40106	Spacer		2-F	2
17	DPS2602Z	Screw	for 15	1-E	2
18	PG Z00110	Earth Terminal		2-D	1
19	PU 51214	Test Connector	TEST POINT	3-B	1
20	LPS2610Z	Screw	for 19	3-B	2
21	—	Rear (1) Board	See Sec. 6.2.3.	5-G	1
22	—	Rear (2) Board	See Sec. 6.2.25.	5-G	1
23	—			—	—
24	—	Audio Sub Board Ass'y	See Sec. 6.2.37.	3-G	1
25	LPS2608Z	Screw	for 24	3-E	2
26	—	Junction Board Ass'y	See Sec. 6.2.11	2-B	1
27	GBST3008Z	Tapping Screw	for 26	1-B	2
28	—			—	—
△ 29	QMF51E2-3R15	Fuse	F001, T3.15A, 250 V	1-C	1
△ 30	QMF51E2-1R6	"	F002, T1.6 A, 250 V	1-C	1
△ 31	PG Z00442	Noise Filter		1-E	1
△ 32	PG Z00018	Connector Cover		2-E	1
△ 33	LPS2610Z	Screw	for 31	1-C	2
△ 34	QMG0301-003	Fuse Holder		1-C, 2-D	2
△ 35	PU50316	Fuse Cover		2-E	2
△ 36	SDBP4008N	Screw		1-E	1
△ 37	WLS4000N	Washer		1-D	1
△ 38	NNB4000N	Nut		1-D	1
△ 39	QSR0085-101	Voltage Selector		1-E	1
△ 40	PU54680	V. Selector Cover		1-E	1
△ 41	LPS2608Z	Screw	for 39	1-C	2
△ 42	PU55145C-1	Power Bracket Ass'y		1-D	1
43	LPS2608Z	Screw	for 42	1-C, D	2
△ 44	A50221-2	Earth Lug		1-D	1
△ 45	NNS3000N	Nut		1-E	2
46	—			—	—
47	PU54965	Fuse Sticker	for F001	1-C	1
48	PU54965-2	Fuse Sticker	for F002	1-C	1
49	—			—	—
50	—			—	—
51	PG Z00173	7-pin Connector		2-C, 4-G	1
52	PG Z00174	7-pin Connector		3-C, 4-G	1
53	PU43135-1-65	Nylon Edging		3-E	1
54	PU43135-1-80	Nylon Edging		3-F	1

5.2.7 Main-deck (1) assembly

A

B

C

D

E

F

G

H

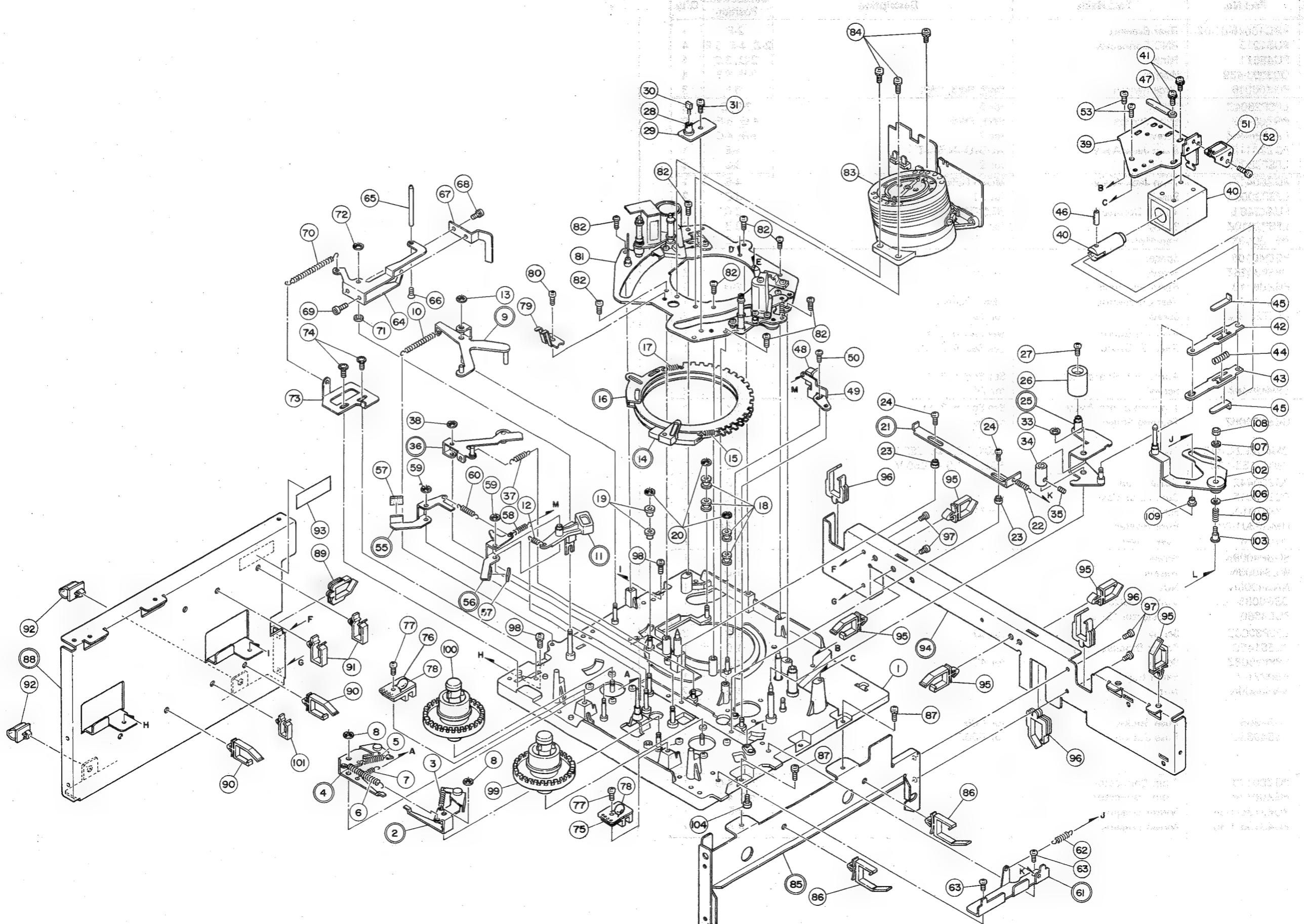
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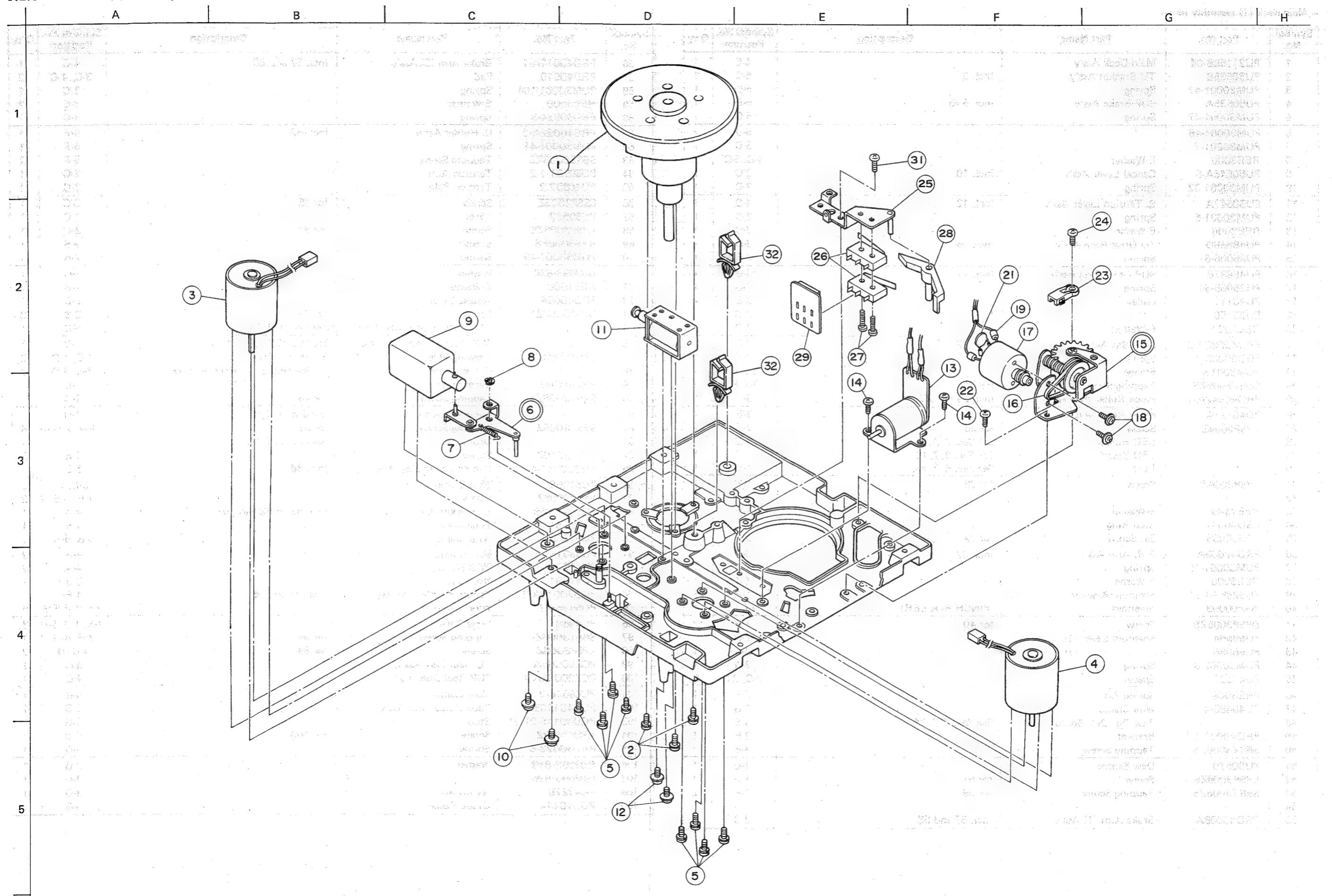


- Main-deck (1) assembly list -

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	PU21159B-04	Main-Deck Ass'y		4-E	1
2	PU50535B	TU Bracket Ass'y	Incl. 3	5-C	1
3	PUM30001-47	Spring		5-C	1
4	PU50535A	SUP Brake Ass'y	Incl. 5 to 7	5-B	1
5	PUM30001-47	Spring		5-C	1
6	PUM30001-46	"		5-C	1
7	PUM30001-7	"		5-C	1
8	RE E3000	E-Washer		4-C, 5-C	2
9	PU50545A-5	Cancel Lever Ass'y	Incl. 10	2-C	1
10	PU M30001-32	Spring		2-C	1
11	PU50547A	B. Tension Lever Ass'y	Incl. 12	4-D	1
12	PUM30001-6	Spring		3-C	1
13	RE E3000	E-Washer		2-C	1
14	PU48838D	TU Drive Ring Ass'y	Incl. 15	3-D	1
15	PU35005-81	Spring		3-E	1
16	PU48837B	SUP Drive Ring Ass'y	Incl. 17	3-D	1
17	PU35005-81	Spring		2-D	1
18	PU48711	Pulley		3-E	4
19	PU50758	"		3-D	2
20	RE E3000	E-Washer		3-D	3
21	PR D40002A-2	Slide Bar Ass'y	Incl. 22	3-F	1
22	PG D30003-2	Spring		3-F	1
23	PUM30013	Flange		3-E,F	2
24	SDST3006ZS	Tapping Screw	for 21	3-E,F	2
25	PR D40042A-2	Pinch Roller Arm Ass'y	Incl. 26 and 27	3-F	1
26	PQ40137A	Pinch Roller Ass'y		3-E	1
27	LPSP2604Z	Screw	for 26	2-F	1
28	-	LED Holder	See Sec. 6.2.15.	1-D	1
29	-	LED Board	See Sec. 6.2.15.	1-D	1
30	-	LED	See Sec. 6.2.15.	1-D	1
31	LPSP3004Z	Screw	for 28	1-E	1
32	-	-		-	-
33	REE2500	E-Washer		3-F	1
34	PRD40037	Stop Ring		3-F	1
35	YFS3003S	Set Screw	for 34	3-F	1
36	PRD40005A	F.R. Arm Ass'y	Incl. 37	3-C	1
37	PUM30001-15	Spring		3-C	1
38	REEE3000	E-Washer		3-C	1
39	PU32857-1-2	Solenoid Bracket		1-F	1
40	PGZ00093	Solenoid	(PINCH ROLLER)	2-F, G	1
41	DPSP3005ZS	Screw	for 40	1-G	2
42	PU50564	Solenoid Lever (1)		2-G	1
43	PU50565	" (2)		3-G	1
44	PUM30002-8	Spring		2-G	1
45	PU47327	Spacer		2-G, 3-G	2
46	PRE3008	Spring Pin		2-F	1
47	PU49485-4	Wire Clamp		1-G	1
48	-	Pick Out Det. Board	See Sec. 6.2.34.	2-E	1
49	PRD40007-1-1	Bracket		3-E	1
50	SBST3006ZS	Tapping Screw		2-E	1
51	PU50570	Dew Sensor		1-G	1
52	LPSP3006ZS	Screw	for 51	1-G	1
53	SBST3006ZS	Tapping Screw	for 39	1-F	2
54	-	-		-	-
55	PRD40008A	Brake Arm (1) Ass'y	Incl. 57 and 58	3-C	1

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
56	PRD40011A-1	Brake Arm (2) Ass'y	Incl. 57 and 60	4-C	1
57	PRD40010	Pad		3-C, 4-C	2
58	PUM30001-104	Spring		3-C	1
59	REE3000	E-Washer		3-C	2
60	PRD30024-3	Spring		3-C	1
61	PRD40022A-2	C. Holder Ass'y	Incl. 62	5-F	1
62	PUM30001-44	Spring		5-F	1
63	SBST3008ZS	Tapping Screw		5-F	2
64	PU50581-1-2	Tension Arm		2-C	1
65	PU44852-2	Tension Pole		2-C	1
66	SSSP2605Z	Screw	for 65	2-C	1
67	PU50582	Lever		2-C	1
68	LPSP3006ZS	Screw	for 67	2-C	1
69	BYS3006FS	S. Bolt		2-B	1
70	PUM30001-49	Spring		2-B	1
71	Q03093-830	Washer		2-C	1
72	REE1500	E-Washer		2-B	1
73	PRD40004	Adjust Lever		3-B	1
74	NPSP3008ZY	Screw	for 73	2-B	2
75	-	TU Photo Interrupter Ass'y	See Sec. 6.2.27.	5-D	1
76	-	SUP Photo Interrupter Ass'y	See Sec. 6.2.28.	4-C	1
77	SBST3008ZS	Tapping Screw	for 75 x 1, 76 x 1	4-C, 5-D	2
78	-	C. Capacitor	C1 See Sec. 6.2.27 and 6.2.28.	4-C, 5-D	2
79	PRD40300	Earth Plate		2-C	1
80	SBST3008ZY	Tapping Screw	for 79	2-C	1
81	-	Sub-Deck Ass'y	See Sec. 5.2.9.	2-D	1
82	SBST3008Z	Tapping Screw	for 81	1-D, 2-D,E	8
83	-	Drum Ass'y	See Sec. 5.2.10.	1-E	1
84	LPSP3010Z	Screw		1-E	3
85	PGD20014A	Center Lower Stay Ass'y	Incl. 86	5-E	1
86	PU54969	Wire Clamp		5-E, F	2
87	LPSP3008Z	Screw		4-F, 5-E	2
88	PGD20015B	L. Bracket Ass'y	Incl. 89 to 92 and 101	4-A	1
89	PU49881	Edge Cover		4-B	1
90	PU54969-2	Wire Clamp		4-B, 5-B	2
91	PU48016	Mini Clamp		4-B	2
92	PU47876	PWB Holder		4-A	2
93	PU42091	No. Plate		3-B	1
94	PGD20016A-3	Center Bracket (A) Ass'y	Incl. 95 and 96	4-F	1
95	PU54969-2	Wire Clamp		3-F, 4-E,F,G	5
96	PU49881	Edge Cover		3-E, 4-G,5-F	3
97	SBST3006Z	Tapping Screw	for 94	3-F, 4-G	4
98	LPSP3008Z	Screw	for 88	4-C, D	2
99	PGZ00094A-1	TU Reel Disk Ass'y		5-C	1
100	PGZ00095A-1	SUP Reel Disk Ass'y		4-C	1
101	PU48016-2	Mini Clamp		5-B	1
102	PGD40113B-2	Tape Guide Arm Ass'y		3-G	1
103	PGD40115-01-01	Stud		3-G	1
104	LPSP2608Z	Screw	for 103	5-D	1
105	PRD30023-8	Spring		3-G	1
106	Q03093-819	Washer		3-G	1
107	Q03093-826	"		3-G	1
108	PU49276	Nylon Nut		3-G	1
109	PGD40114	Guide Roller		3-G	1

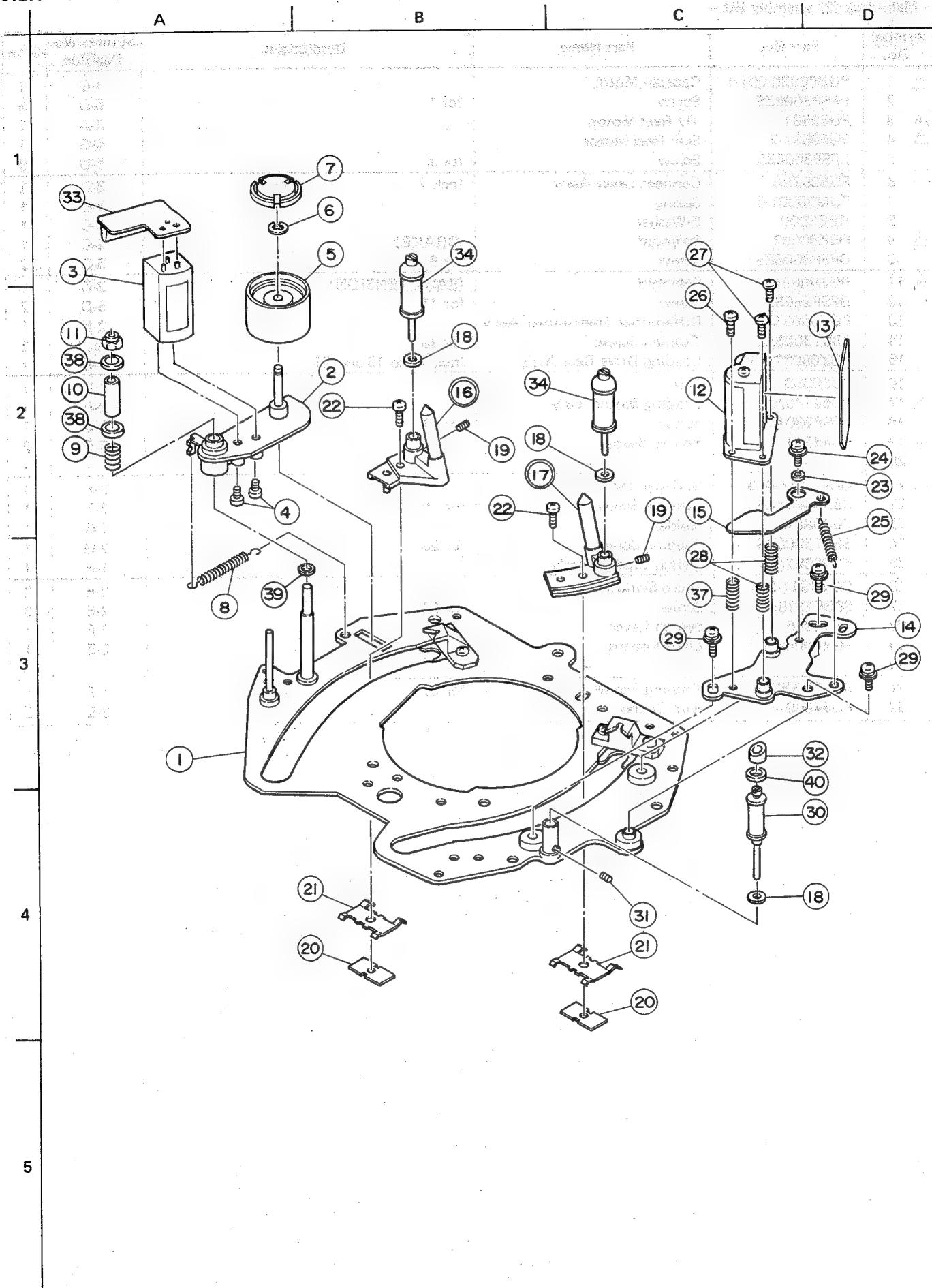
5.2.8 Main-deck (2) assembly



— Main-deck (2) assembly list —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
△ 1	PGZ00026-001-1	Capstan Motor		1-C	1
2	LPSP3008ZS	Screw	for 1	5-D	3
△ 3	PU50531	TU Reel Motor		2-A	1
△ 4	PU50531-2	SUP Reel Motor		4-G	1
5	LPSP3006ZS	Screw	for 3	5-D	8
6	PU50538A	Connect Lever Ass'y	Incl. 7	3-C	1
7	PUM30001-6	Spring		3-C	1
8	RE E3000	E-Washer		2-C	1
△ 9	PGZ00092	Solenoid	(BRAKE)	2-C	1
10	DPSP3008ZS	Screw	for 9	5-C	2
△ 11	PGZ00091	Solenoid	(BACK TENSION)	2-D	1
12	DPSP2608Z	Screw	for 11	5-D	2
13	PGZ00031	Differential Transformer Ass'y		2-F	1
14	SBST3006ZS	Tapping Screw	for 13	3-E, F	2
15	PGZ00032A-1	Loading Drive Gear Ass'y	Incl. 16 to 19 and 21	2-G	1
16	PU50350	Belt		3-F	1
△ 17	PU52745A	Loading Motor Ass'y		2-F	1
18	LPSP2604Z	Screw	for 17	3-G	2
△ 19	PU45811	Ferrite Beads		2-F	2
20	—	—	—	—	—
△ 21	QCF11HP-473	C. Capacitor		2-F	1
22	SBST3006ZS	Tapping Screw	for 15	3-F	1
23	PU43981	Holder		2-G	1
24	SBST3006ZS	Tapping Screw	for 23	2-G	1
25	PU48952A-3	Switch Bracket Ass'y		1-F	1
26	QSM1S11-211	Micro Switch		2-E	2
27	SPBP2316N	Screw	for 26	2-E	2
28	PU48955	Switch Lever		2-F	1
29	PG E40069-1-1	Circuit board		2-E	1
30	—	—	—	—	—
31	SBST3006ZS	Tapping Screw	for 25	1-F	1
32	PU54969-2	Wire Clamp		2-E	2

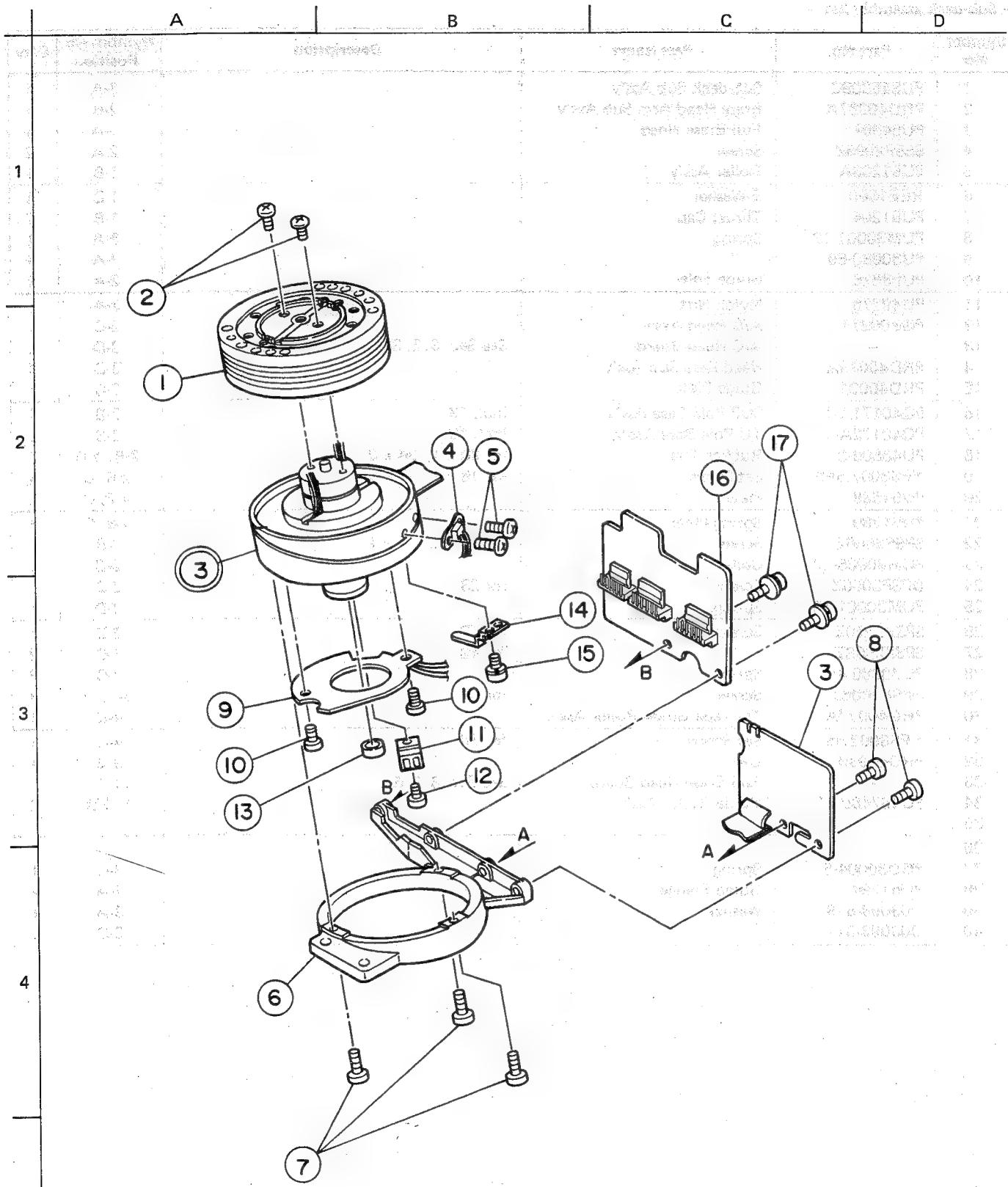
5.2.9 Sub-deck assembly



— Sub-deck assembly list —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	PUS46309C	Sub-deck Sub Ass'y		3-A	1
2	PRD40087A	Erase Head Arm Sub Ass'y		2-B	1
3	PU54397	Full Erase Head		1-A	1
4	SSSP2005Z	Screw		2-A	2
5	PU51203A	Roller Ass'y		1-B	1
6	REE1500	E-Washer		1-B	1
7	PU51204	Thrust Cap		1-B	1
8	PUM30001-13	Spring		3-A	1
9	PU30080-69	"		2-A	1
10	PU53826	Guide Pole		2-A	1
11	PU49276	Nylon Nut		2-A	1
12	PGZ00271	A/C Head Ass'y		2-C	1
13	—	A/C Head Board		2-D	1
14	PRD40019A	Head Base Sub Ass'y		3-D	1
15	PRD40021	Guide Plate		2-C	1
16	PQ40171A-1	SUP Pole Base Ass'y	Incl. 19	2-B	1
17	PQ40172A-1	TU Pole Base Ass'y	Incl. 19	2-B	1
18	PU48806-3	Rubber Tire	for 30 x 1, 34 x 2	2-B, 4-D	3
19	YFS3002.5FS	Set Screw	for 16 x 1, 17 x 1	2-B, C	2
20	PU51638	Plate		4-B, C	2
21	PU51299	Spring Plate		4-B, C	2
22	SPSP2606Z	Screw	for 16 x 1, 17 x 1	2-B	2
23	PUM30005-12	Collar		2-D	1
24	DPSP3006Z	Screw		2-D	1
25	PUM30001-19	Spring	for 23	2-D	1
26	SPSP2610Z	Screw	for 12	2-C	1
27	SPSP2608Z	"	for 12	1-C	2
28	PU30080-49	Spring		3-C	2
29	DPSP3006Z	Screw		3-C, D	3
30	PRD40027A	TU Tape Guide Roller Ass'y	for 14	4-D	1
31	YFS3002.5S	Set Screw	for 30	4-C	1
32	PRD40030	Cap		3-D	1
33	—	Full Erase Head Board	See Sec. 6.2.6.	1-A	1
34	PU48748B	Guide Roller Ass'y		1, 2-B	2
35	—	—		—	—
36	—	—		—	—
37	PGD30004-5	Spring		3-C	1
38	PU51294	Guide Flange		2-A	2
39	Q03093-819	Washer		3-A	1
40	Q03093-817	"		3-D	1

5.2.10 Drum assembly

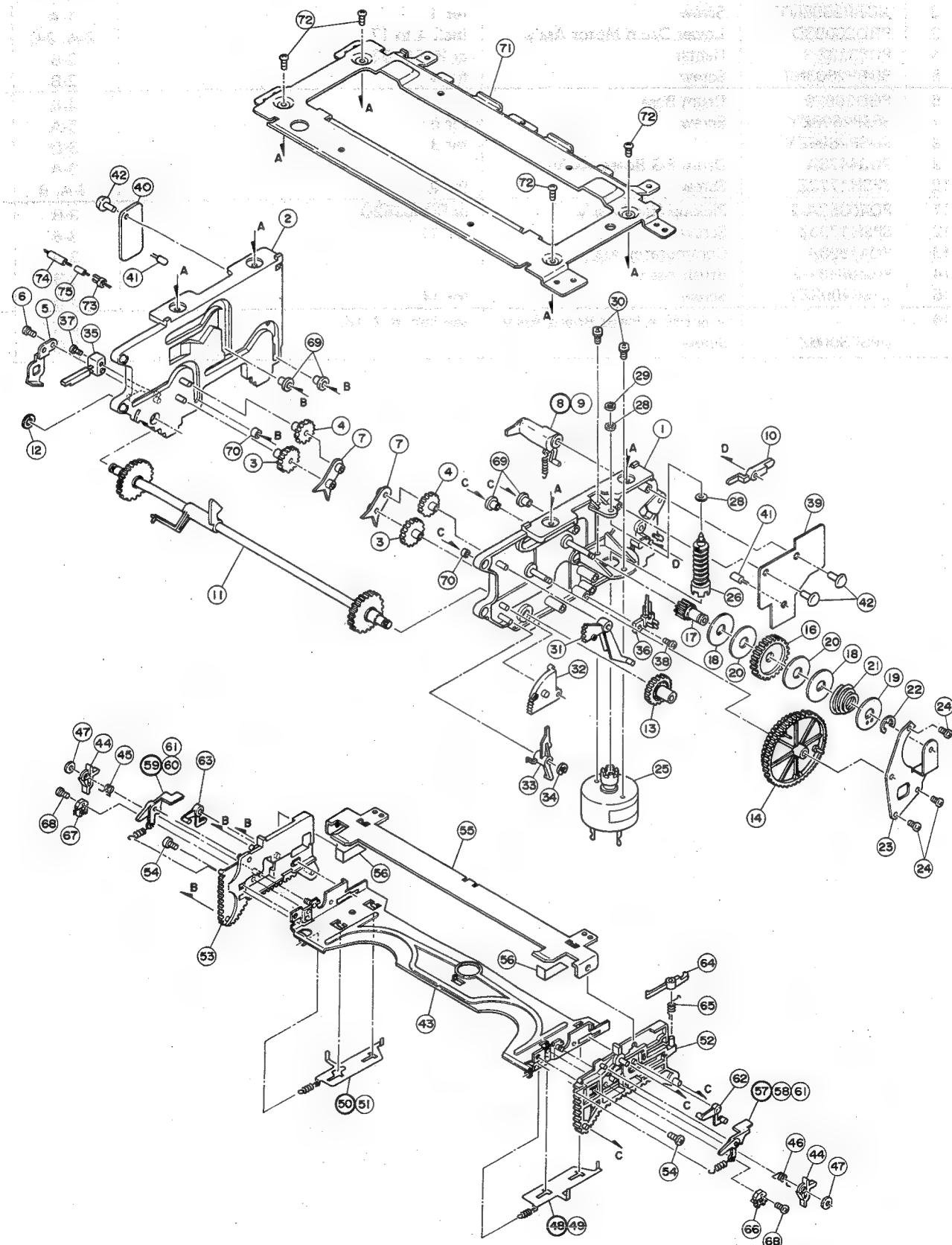


— Drum assembly list —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	PRD20022C	Upper Drum Ass'y		2-A	1
2	NDBP2608NY	Screw	for 1	1-A	2
3	PRD20003D	Lower Drum Motor Ass'y	Incl. 4 to 17	2-A, 3-C	1
4	PU56202-3	Heater	or PU56202	2-B	1
5	SDBP2603NT	Screw	for 4	2-B	2
6	PGD20029	Drum Base		4-A	1
7	SPSP2608ZY	Screw	for 6	5-A	3
8	SDSP2606ZY	"	for 3	3-D	2
9	PU34473A	Drum FG Board Ass'y		3-A	1
10	SPSH1722Z	Screw	for 9	3-A, B	2
11	PQ40352A-2	Pick-up Head Ass'y	or PQ40352D	3-B	1
12	SPSH1735Z	Screw	for 11	3-B	1
13	PQ41596A	Commutator Ass'y		3-A	1
14	PGZ00137-2	Brush Ass'y		3-B	1
15	LPSP2003ZY	Screw	for 14	3-B	1
16	—	V & FM A Head Board Ass'y	See Sec. 6.2.18.	2-C	1
17	DPSP3006Z	Screw		2-C	2

5.2.11 Cassette housing assembly

A B C D



— Cassette housing assembly list —

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
1	PRD30126A-02	R. Guide Stay Assembly		2-C	1
2	PRD30125A	L. Guide Stay Assembly		2-B	1
3	PQ40059	Gear (1)		2-A, 3-B	2
4	PRD40270	" (2)		2-B	2
5	PRD40532	Switch Cover		2-A	1
6	SBSE2608ZY	Screw	for 5	2-A	2
7	PQ40061	Double Cap		2-B	2
8	PQ40102A-1	Door Guide Assembly	Incl. 9	2-C	1
9	PUM30001-111	Spring		2-C	1
10	PQ40063	Guide Lever		2-C	1
11	PRD40119A-1	Connect Gear Assembly		3-A	1
12	PUM30017-11	Washer		2-A	1
13	PRD40118	Cam Gear (2)		3-C	1
14	PRD30124	Main Gear		4-C	1
15	—	—		—	—
16	PRD40527	Worm Wheel		3-C	1
17	PRD40529A	Clutch Gear Assembly		3-C	1
18	PRD40534	Clutch Disk		3-C, 3-D	2
19	PRD49535	Spring Hold Plate		3-D	1
20	PRD40537	Pad		3-C, 3-D	2
21	PRD40538-01-01	Compression Spring		3-D	1
22	REE6000	E-Washer		3-D	1
23	PRD40533	Gear Bracket		4-D	1
24	SBSE2608ZY	Screw	for 23	3-D, 4-D	3
△ 25	PQ40090A	Motor Assembly		4-C	1
26	PRD40291	Worm Assembly		3-C	1
27	—	—		—	—
28	Q03093-838	Washer		2-C, 3-C	2
29	PUM30017	Slit Washer		2-C	1
30	SPSP2604ZY	Screw	for 25	2-C	2
31	PQ40074	Upper Door Opener		3-C	1
32	PQ40075-1-5	Lower Door Opener		3-C	1
33	PQ40076-2	Hold Lever		4-B	1
34	REE2500X	E-Washer		4-C	1
35	PU51259-3	Leaf Switch	(REC SAFETY)	2-A	1
36	PU55377-2	End Switch	(HOUSING UP/DOWN DET) or PU55377-1-1	3-C	1
37	SPSP2010ZY	Screw	for 35	2-A	1
38	SBSE2608ZY	"	for 36	3-C	1
39	—	Cassette Housing Board	See Sec. 6.2.18.	3-C	1
40	—	End Sensor Board	See Sec. 6.2.13.	1-A	1
41	—	Photo Transistor	See Sec. 6.2.13 and 6.2.18.	2-A, 3-C	2
42	PU48973-3	Stopper		1-A, 3-D	3
43	PRD30123A	Cassette Holder Assembly		4-B	1
44	PRD30122-01-01	Switch Lever		3-A, 5-C	2
45	PRD40539	Torsion Spring (L)		4-A	1
46	PRD40540	" (R)		5-C	1
47	PUM30017	Slit Washer		3-A, 5-D	2
48	PQ40106B-1	R. Side Plate Assembly	Incl. 49	5-C	1
49	PUM30001-210	Spring		5-C	1
50	PQ40107B-2	L. Side Plate Assembly	Incl. 51	5-B	1
51	PUM30001-210	Spring		5-B	1
52	PQ10009-1-4	R. Bracket		5-C	1
53	PQ10009-2-3	L. Bracket		4-A	1
54	SPSP2003ZY	Screw	for 52 x 1, 53 x 1	4-A, 5-C	2
55	PQ30032-1-3	Reinforcement		4-B	1

Symbol No.	Part No.	Part Name	Description	Symbol No. Position	Q'ty
56	PGD40204	Teflon Sheet	for 57 x 1, 59 x 1	4-B	2
57	PQ40108B-3	R. Lock Lever Assembly	Incl. 58 and 61	5-C	1
58	PUM30001-110	Spring	Incl. 60 and 61	5-C	1
59	PQ40109B-3	L. Lock Lever Assembly	Incl. 60 and 61	4-A	1
60	PUM30001-110	Spring	Incl. 60 and 61	4-A	1
61	PUM30019-10	"	for 57 x 1, 59 x 1	3-A, 5-C	2
62	PQ40081A	R. Switch Lever		5-C	1
63	PQ40081B	L. Switch Lever		4-A	1
64	PQ40083-1-5	Lid Opener		4-C	1
65	PQ40084-1-2	Torsion Spring		4-C	1
66	PGZ00503	R. Insert Switch	(CASS. IN DET.)	5-C	1
67	PGZ00502	L. Insert Switch	(CASS. IN DET.)	4-A	1
68	SPSK1705M	Screw	for 66 x 1, 67 x 1	4-A, 5-C	2
69	PQ40086	Roller		2-B	4
70	PQ40087-2	Mini Roller		2-A, 3-B	2
71	PRD20034	Roof Plate		1-B	1
72	SBSE2608ZY	Screw	for 71	1-B, 1-C	4
△ 73	PQ40299	Wire Cap		2-A	1
△ 74	QXT329H-035	UL Tube		2-A	1
75	PRD40101	Wire Guard		2-A	1
76	—	—		—	—
77	—	—		—	—
78	—	—		—	—
79	—	—		—	—
80	—	—		—	—
81	PGS20108C	Cassette Housing Assembly	Incl. 1 to 26 and 28 to 75	—	1

SECTION 6

ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the  symbol are critical for safety. Replace only with specified part numbers.

6.1 STANDARD PART NUMBER CODING

6.1.1	Fixed resistor coding	6-2
6.1.2	Fixed capacitor coding	6-3
6.1.3	Fuse coding	6-5

6.2 ELECTRICAL PARTS LIST BY ASSEMBLIES

6.2.1	Audio board assembly	0 1	6-6
6.2.2	FM audio board assembly	0 2	6-11
6.2.3	Rear-1 board assembly	0 3	6-16
6.2.4	SW board	0 4	6-16
6.2.5	VR board (1) assembly	0 5	6-16
6.2.6	Full erase head board	0 6	6-16
6.2.7	Regulator board assembly	0 7	6-17
6.2.8	Syscon board assembly	0 8	6-18
6.2.9	PRE/REC board assembly	0 9	6-22
6.2.10	Color board assembly	1 0	6-26
6.2.11	Junction board assembly	1 1	6-31
6.2.12	Y amp. board assembly	1 2	6-32
6.2.13	End sensor board	1 3	6-37
6.2.14	Operation board assembly	1 4	6-38
6.2.15	LED board	1 5	6-38
6.2.16	Counter board assembly	1 6	6-39
6.2.17	Cassette housing board	1 8	6-40
6.2.18	V & FMA head board assembly	1 9	6-40
6.2.19	Reel servo board assembly	2 0	6-40
6.2.20	Capstan servo board assembly	2 1	6-44
6.2.21	Drum servo board assembly	2 2	6-47
6.2.22	Mother board assembly	2 3	6-51
6.2.23	Search VR board	2 4	6-51
6.2.24	Front LED board	2 5	6-51
6.2.25	Rear-2 board	2 6	6-51
6.2.26	LD/UNLD SW board	2 7	6-51
6.2.27	Photo interrupter (TU reel FG) board	2 8	6-51
6.2.28	Photo interrupter (Supply reel FG) board	2 9	6-51
6.2.29	Jack board	3 0	6-52
6.2.30	Display board assembly	3 2	6-52
6.2.31	VR board (2) assembly	3 3	6-52
6.2.32	VR board (3) assembly	3 4	6-52
6.2.33	A/C head board assembly	3 5	6-52
6.2.34	Pickout detector board	3 8	6-52
6.2.35	Hour meter board	4 0	6-52
6.2.36	Power transistor board	4 1	6-52
6.2.37	Audio sub board assembly	4 2	6-53
6.2.38	C/F sub board assembly	4 6	6-53
6.2.39	Color frame servo board assembly	6 3	6-53

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

RESISTORS – All resistance values are in ohms (Ω)

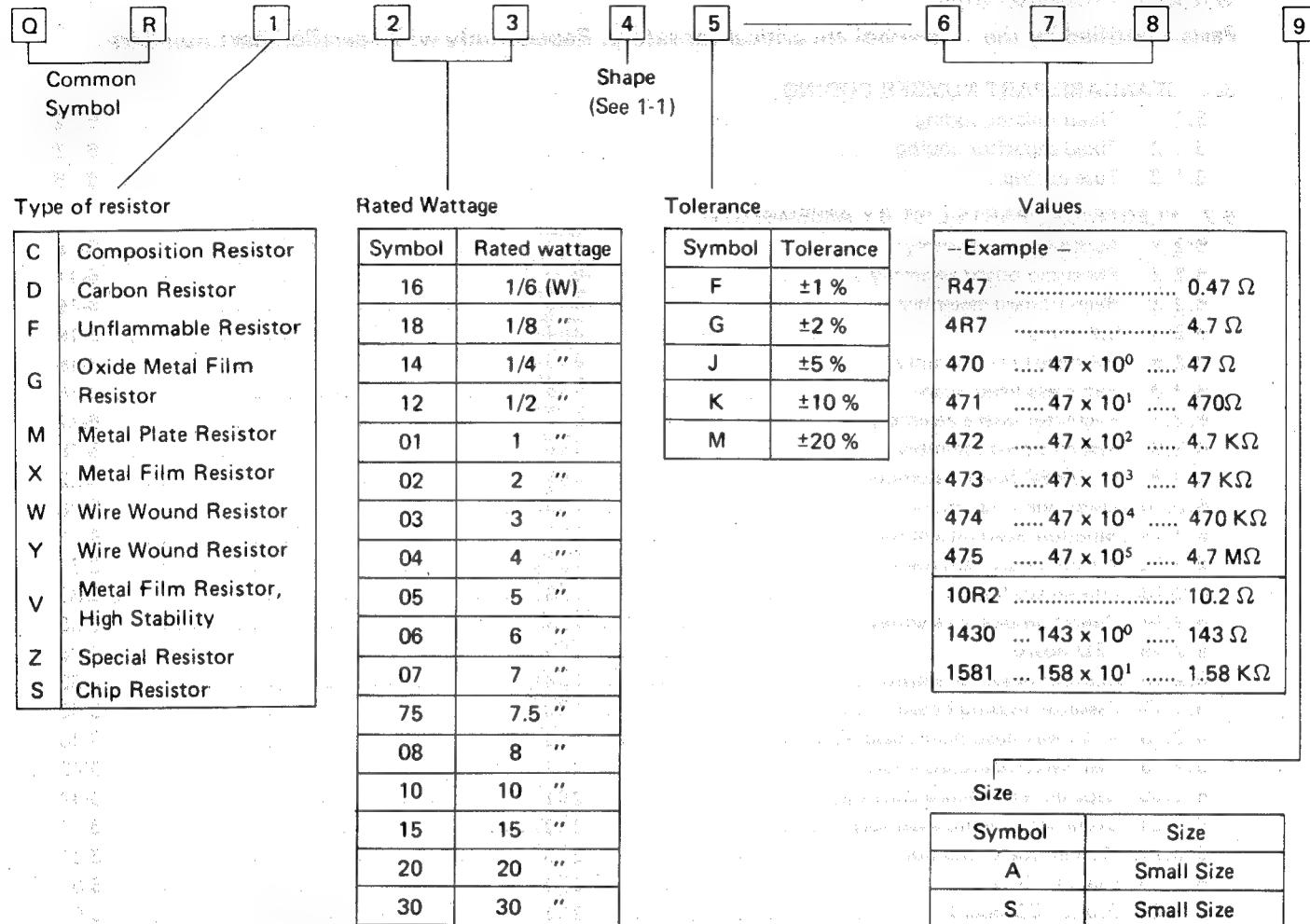
K	: 1 000
M	: 1 000 000
CR	: Carbon Resistor
Comp. R	: Composition Resistor
WR	: Wire Wound Resistor
OMR	: Oxide Metal Film Resistor
VR	: Variable Resistor (Potentiometer)
MFR	: Metal Film Resistor
FR	: Fusible Resistor
PMR	: Precision Metal Film Resistor

CAPACITORS – All capacitance values are in $\mu\mu F$, unless otherwise indicated.

P	: $\mu\mu F$	PS Cap	: Polystyrol Capacitor
C Cap	: Ceramic Capacitor	T Cap	: Tantalum Capacitor
E Cap	: Electrolytic Capacitor	TR Cap	: Trimmer Capacitor
FM Cap	: Film Mica Capacitor	LL Cap	: Low Leak Current
MM Cap	: Metallized Mylar Capacitor		Electrolytic Capacitor
MP Cap	: Metallized Paper Capacitor	TF Cap	: Thin Film Capacitor
MY Cap	: Mylar Capacitor		
NP Cap	: Non-polar Capacitor		
PC Cap	: Polycarbonate Capacitor		
PP Cap	: Poly Pro Capacitor		

6.1 STANDARD PART NUMBER CODING

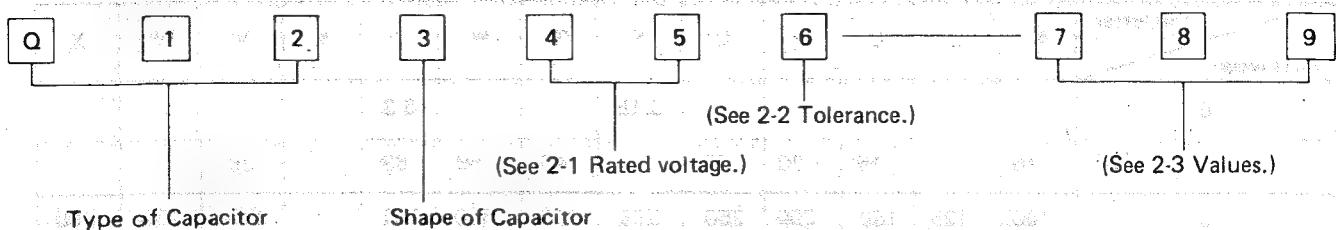
6.1.1 Fixed Resistor Coding



1-1) Shape of resistor (: Flame retardant resistor)

Sort	C	D	G	F	M	W	X	Y	V
1									
2									
3									
4									
5						L type			
6						Resin-Covered			
7									
8						Enamelled			
9									

6.1.2 Fixed Capacitor Coding



Type of Capacitor

Shape of Capacitor

Ceramic Capacitors

Symbol	Type of Capacitor	Disk Lead	Kink Lead			
QCC	Ceramic			4	5	
QCF	"	1	3			
QCS	"	1	3			
QCT	Temperature compensation					
QCX	Special			1	3	
QCY	Ceramic	1, 4	3			8
QCZ	Special					

Electrolytic Capacitors

Symbol	Type of Capacitor	Tubular	Mono-direction	Anti-stress	Forming	Snap-in
QEA	Characteristic A	2	4			
QEB	Low Leakage		4	5	6	
QED	Characteristic D	2	4			
QEE	Tantalum		4	5		
QEE	" (small type)		8			
QEK	Characteristic W (subminiature type)		4	5		
QEL	Characteristic L					7
QEN	Non-polar	2	4	5	6	
QET	Characteristic W (small type)	2	4	5	6	
QEWF	Characteristic W	2	4	5	6	7
QEZ	Special					

Paper Film Capacitors

Symbol	Type of Capacitor	Tubular	Normal		Flame retardant	
			Mono-direction	Kink Lead	Mono-direction	Kink Lead
QFF	Film mica		4			
QFH	Metalized mylar	2	4	3	5	6
QFM	Mylar	2	4	3, 7	5	6
QFN	" (small type)		4			
QFP	Polypropylene		4	3		
QFS	Polystyrene	2	4	3		
QFZ	Special					

2-1) Rated voltage (V)

First letter \ 2nd letter	A	B	C	D	E	F	G	H	J	K	V	W	X
0						3.15			6.3				
1	10		16	20	25		40	50	63		35		
2	100	125	160	200	250	315	400	500	630		350	450	600
3	1000	1250		2000				5000					

2-2) Tolerance

Symbol	F	G	J	K	M	N	Z	P	A	H	R
(%)	± 1	± 2	± 5	± 10	± 20	± 30	$+80$ -20	$+100$ -0	$+100$ -10	$+50$ -10	$+30$ -10

2-3) Values

— Example — Values are in picofarads.

101	10×10^1	100 pF
102	10×10^2	1,000 pF = 0.001 μ F
103	10×10^3	10,000 pF = 0.01 μ F
104	10×10^4	100,000 pF = 0.1 μ F
5R0	5.0	5 pF

6.1.3 Fuse Coding

Common symbol		Characteristics			Values				
Q	M	F	1	2	3	4	5	6	7
Shape of fuse									
Shape of Fuse (first and second digit)									
Symbol No.	Shape	Remarks							
51		$\phi 5.2 \times 20 \text{ mm}$							
60		$\phi 6.4 \times 30 \text{ mm}$							
61		$\phi 6.35 \times 31.8 \text{ mm}$							
63		With 60 Lead Wire							
66		With 61 Lead Wire							
Symbol No.	Rated Voltage								
1	AC 125 V								
2	AC 250 V								
3	100 mA	AC 250 V							
	1 A								
	1.25 A								
	6.3 A	AC 125 V							
Value (fifth – seventh digit)									
– Example –									
R10	.....	100 mA							
R125	.....	125 mA							
1R0	.....	1.0 A							
1R2	.....	1.2 A							
1R25	.....	1.25 A							
100	.....	10 A							
Symbol No.	Fusing Current	Fusing Time	Remarks						
S	160%	Within 1 hr.	Anti-rush Type						
	200%	" 2 min.							
	700% – 2000%	" 0.01 sec.							
R	160%	" 1 hr.	Regular Fusible Type						
	200%	" 2 min.							
M	135%	" 1 hr.	Regular Fusible Type (for UL)						
	200%	" 2 min.							
U	135%	" 1 hr.	Anti-rush Type (for UL)						
	200%	" 2 min.							
	800% – 2000%	" 0.01 sec.							
A	210%	" 2 min.	Anti-rush Type (for Europe)						
	275%	0.5 – 10 sec.							
	400%	0.15 – 2 sec.							
	1000%	0.02 – 0.3 sec.							
B	210%	Within 30 min.	Regular Fusible Type (for SEMKO, Europe)						
	275%	0.05 – 2 sec.							
	400%	0.01 – 0.3 sec.							
C	135%	Within 1hr.	Anti-rush Type (for UL, Japan)						
	200%	" 2 min.							

6.2 ELECTRICAL PARTS LIST BY ASSEMBLIES

6.2.1 Audio board assembly 01 PGE20086B-02

Symbol No.	Part No.	Part Name	Description
IC 1	AN6394	Integrated Circuit	
IC 2	TA7629P	"	
IC 3	AN6394	"	
IC 4	TA7629P	"	
IC 5	TK15021	"	
IC 6	-		
IC 7	M5218P	Integrated Circuit	
IC 8	"	"	
Q 1	2SC2878AB	Transistor	
Q 2	DTC144WF	D. Transistor	
Q 3	"	"	
Q 4	DTA144WF	"	
Q 5	2SD661TU	Transistor	
Q 6	2SC2021R	"	
Q 7	2SC2021LNE	"	
Q 8	"	"	
Q 9	2SD958TU	"	
Q10	"	"	
Q11	2SB788T	"	
Q12	2SC2021R	"	
Q13	-	-	
Q14	2SC2878AB	Transistor	
Q15	DTC144WF	D. Transistor	
Q16	"	"	
Q17	2SD661TU	Transistor	
Q18	-	-	
Q19	2SC2021LNE	Transistor	
Q20	"	"	
Q21	2SD958TU	"	
Q22	"	"	
Q23	2SB788TU	"	
Q24	2SC2021R	"	
Q25	DTA144WF	D. Transistor	
Q26	DTC144WF	"	
Q27	"	"	
Q28	"	"	
Q29	"	"	
Q30	"	"	
Q31	"	"	
Q32	-	-	
Q33	-	-	
Q34	DTC144WF	D. Transistor	
Q35	"	"	
Q36	2SC2878AB	Transistor	
Q37	"	"	
Q38	DTC144WF	D. Transistor	
Q39	"	"	
Q40	2SC2878AB	Transistor	
Q41	"	"	
Q42	-	-	
Q43	2SB793AR	Transistor	
Q44	2SD973AR	"	
Q45	DTC144WF	D. Transistor	

Symbol No.	Part No.	Part Name	Description
Q46	DTA144WF	D. Transistor	
Q47	"	"	
Q48	2SC2655Y	Transistor	
Q49	2SD973AR	"	
Q50	DTC144WF	D. Transistor	
Q51	"	"	
Q52	DTA124EF	"	
Q53	2SD639RS	Transistor	
Q54	"	"	
Q55	-	-	
Q56	-	-	
Q57	2SB643R	Transistor	
Q58	2SD639RS	"	
Q59	"	"	
D 1	1SS133	Diode	
D 2	MA150	"	
D 3	1SS133	"	
D 4	MA150	"	
D 5	1SS133	"	
D 6	RD2.0EB	Zener Diode	
D 7	1SS133	Diode	
D 8	RD3.6EB2	Zener Diode	
D 9	1SS133	Diode	
D10	RD3.6EB2	Zener Diode	
D11	"	"	
D12	-	-	
D13	-	-	
D14	-	-	
D15	-	-	
D16	RD3.6EB2	Zener Diode	
D17	1SS133	Diode	
D18	"	"	
D19	"	"	
D20	RD2.0EB	Zener Diode	
D21	RD3.6EB2	"	
D22	1SS133	Diode	
D23	"	"	
D24	OA90	"	
D25	"	"	
D26	"	"	
D27	"	"	
D28	-	-	
D29	-	-	
D30	1SS133	Diode	
D31	"	"	
D32	MA162	"	
D33	"	"	
R 1	QRD161J-103	CR	
R 2	" -103	"	
R 3	" -123	"	
R 4	" -821	"	
R 5	" -333	"	

AUDIO

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
R 6	QVZ3506-152	VR	L-CH PB EQ	R71	QRD161J-102	CR	R-CH PB EQ
R 7	QRD161J-102	CR		R72	" -332	"	
R 8	" -102	"		R73	QVZ3506-222	VR	R-CH REC LEV
R 9	QVZ3506-103	VR	L-CH PB LEV	R74	QRD161J-470	CR	
R10	QRD161J-102	CR		R75	" -223	"	
R11	" -332	"		R76	QRX019J-151S	MFR	
R12	QVZ3506-222	VR	L-CH REC LEV	R77	QRD161J-102	CR	
R13	QRD161J-470	CR		R78	" -183	"	
R14	" -223	"		R79	QRG129J-150	OMR	
R15	QRX019J-151S	MFR		R80	QRD161J-154	CR	
R16	QRD161J-102	CR		R81	" -274	"	
R17	" -183	"		R82	QRV143F-3301	MFR	
R18	QRG129J-150	QMR		R83	QRD161J-272	CR	
R19	QRD161J-154Y	CR		R84	" -562	"	
R20	" -274Y	"		R85	" -181	"	
R21	QRV143F-3301	MFR		R86	" -562	"	
R22	QRD161J-272	CR		R87	" -273	"	
R23	" -562	"		R88	" -473	"	
R24	" -181	"		R89	" -103	"	
R25	" -562	"		R90	" -103	"	
R26	" -273	"		R91	" -682	"	
R27	" -473	"		R92	" -334	"	
R28	" -103	"		R93	" -104	"	
R29	" -103	"		R94	" -103	"	
R30	" -103	"		R95	" -103	"	
R31	" -682	"		R96	" -272	"	
R32	" -103	"		R97	" -153	"	
R33	" -334	"		R98	—	—	
R34	" -104	"		R99	—	—	
R35	" -272	"		R100	—	—	
R36	" -153	"		R101	QRD161J-564	CR	
R37	" -102	"		R102	" -473	"	
R38	" -103	"		R103	" -473	"	
R39	" -333	"		R104	" -222	"	
R40	" -564	"		R105	" -221	"	
R41	" -473	"		R106	" -473	"	
R42	" -473	"		R107	" -222	"	
R43	" -222	"		R108	" -221	"	
R44	" -221	"		R109	" -393	"	
R45	" -473	"		R110	" -183	"	
R46	" -222	"		R111	QRX019J-151S	MFR	
R47	" -221	"		R112	—	—	
R48	QRX019J-151S	MFR		R113	—	—	
R49	QRD161J-393	CR		R114	—	—	
R50	" -183	"		R115	QRD161J-472	CR	
R51	QVZ3506-102	VR	CROSSTALK CAN.	R116	" -122	"	
R52	QRD161J-823	CR		R117	" -821	"	
R53	" -223	"		R118	" -822	"	
R54	" -472	"		R119	" -183	"	
R55	" -122	"		R120	" -153	"	
R56	" -821	"		R121	" -183	"	
R57	" -822	"		R122	" -153	"	
R58	" -183	"		R123	" -183	"	
R59	" -153	"		R124	" -392	"	
R60	" -183	"		R125	" -153	"	
R61	" -153	"		R126	" -392	"	
R62	" -103	"		R127	" -103	"	
R63	" -103	"		R128	" -103	"	
R64	" -123	"		R129	" -153	"	
R65	" -821	"		R130	—	—	
R66	" -333	"		R131	QRD161J-103	CR	
R67	QVZ3506-152	VR	R-CH PB EQ	R132	" -183	"	
R68	QRD161J-102	CR		R133	" -153	"	
R69	" -102	"		R134	—	—	
R70	QVZ3506-103	VR	R-CH PB LEV	R135	QRD161J-103	CR	

AUDIO

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
R136	QRD161J-103	CR		R201	QRD161J-104	CR	
R137	-			R202	-		
R138	-			R203	QRD161J-104	CR	
R139	-			R204	" -104	"	
R140	-			R205	" -822	"	
R141	-			R206	" -822	"	
R142	-			R207	" -681	"	
R143	QRD161J-153	CR		R208	" -562	"	
R144	" -183	"		R209	-		
R145	" -103	"		R210	-		
R146	" -562	"		R211	-		
R147	" -122	"		R212	-		
R148	" -122	"		R213	QRD161J-102	CR	
R149	" -123	"		R214	" -102	"	
R150	" -123	"		R215	" -152	"	
R151	" -124	"		R216	" -152	"	
R152	" -154	"					
R153	" -183	"					
R154	" -153	"					
R155	-	-					
R156	QRD161J-103	CR		R301	-	-	
R157	" -562	"		R302	-	-	
R158	" -122	"		R303	QRD161J-124	CR	
R159	" -122	"		R304	" -102	"	
R160	" -123	"		R305	" -103	"	
R161	" -123	"		R306	" -124	"	
R162	" -124	"		R307	" -103	"	
R163	" -154	"		R308	" -124	"	
R164	-	-		R309	" -102	"	
R165	-	-		R310	" -124	"	
R166	-	-		R311	" -101	"	
R167	-	-		R312	" -101	"	
R168	-	-		R313	-	-	
R169	-	-		R314	QRD161J-102	CR	
R170	-	-		R315	" -102	"	
R171	-	-		R316	-	-	
R172	-	-		R317	QRD161J-472	CR	
R173	-	-		R318	-	-	
R174	-	-		R319	QRD161J-472	CR	
R175	-	-		R320	" -561	"	
R176	-	-		R321	" -561	"	
R177	-	-		R322	" -561	"	
R178	-	-		R323	" -561	"	
R179	QRD161J-102	CR	L-CH METER	R324	" -393	"	
R180	QVZ3506-103	VR		R325	" -393	"	
R181	QRD161J-102	CR		R326	" -4823	"	
R182	QVZ3506-103	VR	R-CH METER	R327	" -823	"	
R183	" -104	"	L-CH BIAS	R328	" -124	"	
R184	" -104	"	R-CH BIAS	R329	" -124	"	
R185	QRD161J-681	CR		R330	" -124	"	
R186	" -471	"		R331	" -124	"	
R187	-	-		R332	" -562	"	
R188	-	-		R333	" -562	"	
R189	-	-		R334	" -472	"	
R190	-	-		R335	" -472	"	
R191	QRD161J-821	CR		C 1	QFN31HK-102	MY Cap	
R192	" -222	"		C 2	QER41HM-335	E CAP	
R193	" -223	"		C 3	QER41EM-475	"	
R194	" -104	"		C 4	QER41CM-336	"	
R195	" -103	"		C 5	QER41HM-335	LL E Cap	
R196	-	-					
R197	-	-					
R198	-	-					
R199	-	-					
R200	-	-					

AUDIO

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
C 6	QEB41CM-106	LL E Cap		C71	QER61CM-106	E Cap	
C 7	QER41CM-226	E Cap		C72	QER41CM-106	"	
C 8	QER41HM-335	"		C73	QFN31HJ-123	MY Cap	
C 9	QER61CM-336	"		C74	QER60JM-107	E Cap	
C10	QFN31HJ-823	MY Cap		C75	QEU41CM-107	"	
C11	QER41CM-106	E Cap		C76	QEB41HK-334	LL E Cap	
C12	" -106	"		C77	QEU41CM-227	E Cap	
C13	QER41HM-335	"		C78	QEB41HK-104	LL E Cap	
C14	" -335	"		C79	QEU41CM-227	E Cap	
C15	" -225	"		C80	QER41HM-105	"	
C16	" -105	"		C81	QFN31HJ-103	MY Cap	
C17	QFN31HJ-393	MY Cap		C82	QER41CM-106	E Cap	
C18	QER61CM-106	E Cap		C83	QFP42AF-273M	PP Cap	
C19	QER61HM-335	"		C84	QFN31HK-473	MY Cap	
C20	QER61CM-106	"		C85	QFP42AF-562M	PP Cap	
C21	" -106	"		C86	QER61HM-335	E Cap	
C22	-	-		C87	QFN31HK-682	MY Cap	
C23	QEU41CM-107	E Cap		C88	" -122	"	
C24	QER60JM-107	"		C89	" -122	"	
C25	QEB41HM-334	LL E Cap		C90	QFP42AF-472M	PP Cap	
C26	QEU41CM-227	E Cap		C91	QCS31HJ-681	C Cap	
C27	QEB41HM-104	LL E Cap		C92	QER61HM-474	E Cap	
C28	QEU41CM-227	"		C93	QFN31HJ-123	MY Cap	
C29	QER41HM-105	"		C94	-	LL E Cap	
C30	QFN31HJ-103	MY Cap		C95	QEB41CM-106	"	
C31	QER41CM-106	E Cap		C96	QEB41EM-475	E Cap	
C32	QFP42AF-273M	PP Cap		C97	QER61CM-226	LL E Cap	
C33	QFN31HK-473	MY Cap		C98	QEB41EM-475	E Cap	
C34	QFP42AF-562M	PP Cap		C99	QER61CM-226	"	
C35	QER41HM-335	E Cap		C100	QEU41CM-337	"	
C36	QFN31HK-682	MY Cap		C101	QER61CM-336	"	
C37	" -122	"		C102	QET41CM-227	"	
C38	" -122	"		C103	QER61EM-475	"	
C39	QFP42AF-472M	PP Cap		C104	" -475	"	
C40	QCS31HJ-681	C Cap		C105	QER41EM-475	"	
C41	QER61HM-474	E Cap		C106	-	-	
C42	QFN41HK-103	MY Cap		C107	QER61EM-475	E Cap	
C43	QER41EM-475	E Cap		C108	QER61CM-336	"	
C44	QEB41CM-106	LL E Cap		C109	QER41HM-225	"	
C45	QEB41EM-475	"		C110	QER41EM-475	"	
C46	QER41CM-226	E Cap		C111	QER41CM-336	"	
C47	QEB41EM-475	LL E Cap		C112	QER41HM-225	"	
C48	QER41CM-226	E Cap		C113	-	-	
C49	QEU41CM-337	"		C114	-	-	
C50	QFN41HK-102	MY Cap		C115	-	-	
C51	" -182	"		C116	-	-	
C52	QFN31HK-102	"		C117	-	-	
C53	QER41HM-335	E Cap		C118	QER41HM-335	E Cap	
C54	QER61EM-475	"		C119	-	-	
C55	QER61CM-336	"		C120	-	-	
C56	QER41HM-335	"		C121	-	-	
C57	QEB41CM-106	LL E Cap		C122	-	-	
C58	QER41CM-226	E Cap		C123	-	-	
C59	QER61HM-335	"		C124	-	-	
C60	QER61CM-336	"		C125	-	-	
C61	QFN31HJ-823	MY Cap		C126	QER61EM-335	E Cap	
C62	QER61CM-106	E Cap		C127	QER41CM-106	"	
C63	QER41CM-106	"		C128	QER61HM-335	"	
C64	QER41HM-335	"		C129	QER61CM-106	"	
C65	QER61HM-335	"		C130	QCS31HJ-101	C Cap	
C66	QER41HM-225	"		C131	" -101	"	
C67	QER61HM-105	"		C132	QEU41CM-337	E Cap	
C68	QFN31HJ-393	MY Cap		C133	" -107	"	
C69	QER61CM-106	E Cap		C134	" -107	"	
C70	QER41HM-335	"		C135	-	-	

AUDIO

Symbol No.	Part No.	Part Name	Description
C136	-		
C137	-		
C138	-		
C139	QFN41HK-182	MY Cap	
C140	" -182	"	
C141	-		
C142	QET61EM-335	E Cap	
C143	-		
C144	-		
C145	QEU41CM-107	E Cap	
C146	QCS31HJ-390	C Cap	
C147	" -101	"	
C148	" -101	"	
C149	-		
C150	-		
C151	-		
C152	-		
C153	-		
C154	QER41CM-476	E Cap	
C155	" -476	"	
C156	QER61CM-476	"	
C157	" -476	"	
C158	QCS11HJ-391	"	
C159	" -391	"	
C160	QFN41HK-182	MY Cap	
C161	" -182	"	
C200	QER61CM-476	E Cap	
C201	QEPA1EM-475	NP Cap	
C202	QER61CM-226	E Cap	
C203	QER41CM-476	"	
C204	" -226	"	
C205	" -226	"	
C206	QEPA1EM-475	"	
C207	QER61CM-476	"	
C208	QER61EM-475	"	
C209	QER61CM-226	"	
C210	" -226	"	
C211	" -476	"	
C212	" -476	"	
C213	" -476	"	
C214	QER61EM-475	"	
C215	QER41EM-475	"	
C216	QET41CM-477	"	
C217	" -477	"	
C218	QER41CM-226	"	
C219	QER61EM-475Z	"	
L 1	PGZ00121-472	Peaking Coil	
L 2	PU51764	Low Pass Filter	
L 3	PGZ00121-472	Peaking Coil	
L 4	PU51764	Low Pass Filter	
L 5	PU30284-51R	Choke Coil	
L 6	-	-	
L 7	-	-	
L 8	PU48530-391J	Choke Coil	
L 9	" -391J	"	

Symbol No.	Part No.	Part Name	Description
▲ CP1	ICP-F10	Circuit Protector	
▲ CP2	ICP-F10	"	
RY1	PU55260	Relay	
RY2	"	"	
	PU54983	Test Pin	TP1-21
CN 1	PU43351-3Y	Cap. Housing	
CN 2	" -2Y	"	
CN 3	" -3	"	
CN 4	" -3R	"	
CN 5	" -3	"	
CN 6	" -2	"	
CN 7	" -3R	"	
CN 8	" -7	"	
CN 9	" -3	"	
CN10	" -4	"	
CN11	" -3R	"	
CN12	" -4	"	
CN13	" -2Y	"	
CN14	" -2	"	
CN15	" -4Y	"	
CN16	" -3R	"	
CN17	" -4R	"	
CN18	" -3	"	
CN19	" -6	"	
CN20	" -2	"	
CN21	" -3Y	"	
CN22	" -4	"	
CN23	" -3R	"	
	PGZ00034	Osc. Block	
	PU33643	Shield Case	
	PGD40329-02	Insulator	
	PU53811	Hook (B)	
	PU32908	Servo Board Stay	
	GBST3006Z	Screw	

6.2.2 FM audio board ass'y [0] [2] PGE10010E-01

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
IC 1	HA11752	Integrated Circuit		Q31	2SB643RS	Transistor	
IC 2	AN6392	"		Q32	2SC2647C	"	
IC 3	7VT06	"		Q401	—	D. Transistor	
IC 4	"	"		Q402	—	Transistor	
IC 5	AN6391S	"		Q403	DTA124EF	"	
IC 6	"	"		Q404	2SD639RS	"	
IC 7	EHM-X42U50A	"		Q405	"	"	
IC 8	"	"		D 1	1SS133HV	Diode	
IC 9	M5218P	"		D 2	RD5.1EB2	Zener Diode	
IC10	"	"		D 3	"	"	
IC11	"	"		D 4	"	"	
IC12	"	"		D 5	"	"	
IC13	"	"		D 6	—	"	
IC14	"	"		D 7	—	"	
IC15	TK15021	"		D 8	OA90	Diode	
IC16	"	"		D 9	OA90	"	
IC17	BA634F-T2	"		D10	RD5.6EB2	Zener Diode	
IC18	BA226F-T2	"		D11	RD5.1EB2	Diode	
IC19	M5218P	"		D12	OA90	"	
IC20	TA78L009AP	"		D13	"	"	
IC21	TA78L005AP	"		D14	RD5.6EB2	Zener Diode	
IC22	"	"		D15	RD5.1EB2	Diode	
				D16	OA90	"	
IC41	—	—		D17	"	"	
IC42	—	—		D18	"	"	
IC43	TK15021	"		D19	"	"	
IC44	"	"		D20	1SS133HV	Zener Diode	
				D21	RD5.1EB2	"	
Q 1	2SC2647C	Transistor		D22	—	"	
Q 2	"	"		D23	RD6.2EB3	"	
Q 3	2SD637RS	"		D24	RD5.1EB2	"	
Q 4	2SB643RS	"		D25	—	"	
Q 5	2SD638RS	"		D26	RD6.2EB3	"	
Q 6	2SD637RS	"		D27	1SS133HV	Diode	
Q 7	"	"		D28	"	"	
Q 8	"	"		D29	"	"	
Q 9	"	"		D30	"	"	
Q10	2SD973AR	"		D31	"	"	
Q11	2SD637RS	"		D32	"	"	
Q12	"	"		D33	"	"	
Q13	"	"		D34	"	"	
Q14	"	"		D35	"	"	
Q15	2SD639RS	"		D36	"	"	
Q16	DTC124EF	D. Transistor		D37	WO3C	"	
Q17	"	"		D38	1SS133HV	"	
Q18	"	"		D39	"	"	
Q19	"	"		D40	"	"	
Q20	"	"		D41	RD2.0EB	Zener Diode	
Q21	"	"		D42	"	"	
Q22	"	"					
Q23	"	"		D401	—	"	
Q24	2SC2647C	Transistor		D402	—	"	
Q25	DTA124EF	D. Transistor		D403	—	"	
Q26	"	"		D404	—	"	
Q27	2SC2878AB	Transistor		D405	1SS133HV	Diode	
Q28	2SD639RS	"					
Q29	"	"					
Q30	DTA124EF	D. Transistor					

FM AUDIO

Symbol No.	Part No.	Part Name	Description
R 1	QRD161J-100	CR	DISCRETE
R 2	QRD167J-100	"	DISCRETE
R 3	" -152	"	
R 4	" -152	"	
R 5	" -OR0	"	
R 6	" -332	"	
R 7	" -332	"	
R 8	" -103	"	
R 9	" -103	"	
R10	" -123	"	
R11	" -123	"	
R12	" -223	"	
R13	" -224	"	
R14	" -102	"	
R15	" -473	"	
R16	" -153	"	
R17	" -272	"	
R18	" -471	"	
R19	" -681	"	
R20	" -821	"	
R21	" -102	"	
R22	" -102	"	
R23	" -102	"	
R24	" -102	"	
R25	" -102	"	
R26	" -OR0	"	
R27	" -OR0	"	
R28	" -681	"	
R29	" -102	"	
R30	" -681	"	
R31	" -272	"	
R32	" -682	"	
R33	" -393	"	
R34	" -102	"	
R35	" -121	"	
R36	" -561	"	
R37	-	-	
R38	-	-	
R39	-	-	
R40	-	-	
R41	-	-	
R42	-	-	
R43	QRD167J-151	CR	
R44	" -562	"	
R45	" -393	"	
R46	" -124	"	
R47	" -124	"	
R48	" -682	"	
R49	" -272	"	
R50	" -682	"	
R51	" -472	"	
R52	-	-	
R53	-	-	
R54	-	-	
R55	-	-	
R56	-	-	
R57	-	-	
R58	QRD167J-562	CR	
R59	" -393	"	
R60	" -124	"	
R61	" -124	"	
R62	" -151	"	
R63	" -682	"	
R64	" -272	"	
R65	" -682	"	

Symbol No.	Part No.	Part Name	Description
R66	QRD167J-472	CR	
R67	-	"	
R68	-	"	
R69	QRD167J-152	CR	
R70	" -223	"	
R71	-	"	
R72	-	"	
R73	QRD167J-392	CR	
R74	" -152	"	
R75	" -392	"	
R76	" -561	"	
R77	" -221	"	
R78	" -332	"	
R79	" -332	"	
R80	" -223	"	
R81	" -223	"	
R82	" -123	"	
R83	" -223	"	
R84	" -821	"	
R85	" -820	"	
R86	" -392	"	
R87	" -152	"	
R88	" -392	"	
R89	" -561	"	
R90	" -223	"	
R91	" -221	"	
R92	" -332	"	
R93	" -332	"	
R94	" -223	"	
R95	" -123	"	
R96	" -223	"	
R97	" -821	"	
R98	" -820	"	
R99	" -124	"	
R100	" -333	"	
R101	" -124	"	
R102	" -333	"	
R103	-	-	
R104	QRD167J-561	CR	
R105	" -124	"	
R106	" -333	"	
R107	" -333	"	
R108	" -124	"	
R109	" -561	"	
R110	QVZ3506-682	VR	R-CH METER
R111	" -682	"	L-CH METER
R112	QRD167J-821	CR	
R113	" -102	"	
R114	" -102	"	
R115	" -333	"	
R116	" -393	"	
R117	" -224	"	
R118	" -333	"	
R119	" -224	"	
R120	" -393	"	
R121	QRZ0054-120	Fuse R	
R122	QRD167J-102	CR	
R123	" -103	"	
R124	" -562	"	
R125	" -104	"	
R126	" -151	"	
R127	" -102	"	
R128	" -OR0	"	
R129	QVZ3506-103	VR	L-CH PB LEV
R130	QRD167J-103	CR	R-CH PB LEV

FM AUDIO

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
R131	QRD167J-332	CR	SO-8	R196	QRD167J-273	CR	SO-8
R132	-	-	-	R197	" -154	"	-
R133	QRD167J-102	CR	SO-8	R198	" -102	"	-
R134	" -472	"	-	R199	" -103	"	-
R135	" -123	"	-	R200	" -122	"	-
R136	" -332	"	-	R201	" -122	"	-
R137	QVZ3506-681	VR	L-CH REC FM LEV	R202	" -562	"	-
R138	QRD167J-102	CR	SO-8	R203	" -472	"	-
R139	QVZ3507-222	VR	L-CH CARR.	R204	" -102	"	-
R140	QRD167J-392	CR	SO-8	R205	" -182	"	-
R141	QRD167J-472	"	-	R206	" -182	"	-
R142	" -272	"	-	R207	" -OR0	"	-
R143	" -123	"	-	R208	" -122	"	-
R144	QVZ3506-472	VR	L-CH REC/PB LEV	R209	" -122	"	-
R145	QRD167J-102	CR	SO-8	R210	" -OR0	"	-
R146	" -103	"	-	R211	" -473	"	-
R147	" -562	"	-	R212	" -561	"	-
R148	" -151	"	-	R401	-	"	-
R149	" -104	"	-	R402	-	"	-
R150	" -102	"	-	R403	-	"	-
R151	" -OR0	"	-	R404	-	"	-
R152	QVZ3506-103	VR	R-CH PB LEV	R405	QRD167J-OR0	CR	-
R153	QRD167J-103	CR	SO-8	R406	-	"	-
R154	" -332	"	-	R407	QRD167J-OR0	CR	-
R155	" -102	"	-	R408	-	"	-
R156	" -123	"	-	R409	-	"	-
R157	" -472	"	-	R410	-	"	-
R158	" -102	"	-	R411	QRD163J-183	CR	-
R159	" -272	"	-	R412	QRD167J	"	-
R160	QVZ3506-102	VR	R-CH REC FM LEV	R413	QRD163J-183	"	-
R161	QRD167J-102	CR	SO-8	R414	-	"	-
R162	QVZ3507-222	VR	R-CH CARR.	R415	QRD163J-183	CR	-
R163	QRD167J-272	CR	SO-8	R416	QRD167J-183	"	-
R164	" -472	"	-	R417	-	"	-
R165	" -272	"	-	R418	-	"	-
R166	QVZ3506-472	VR	R-CH REC/PB LEV	R419	-	"	-
R167	QRD167J-333	CR	SO-8	R420	QRD167J-OR0	CR	-
R168	" -103	"	-	R421	-	"	-
R169	" -333	"	-	R422	QRD167J-OR0	CR	-
R170	" -103	"	-	R423	-	"	-
R171	" -223	"	-	R424	-	"	-
R172	" -223	"	-	R425	-	"	-
R173	" -122	"	-	R426	-	"	-
R174	" -103	"	-	R427	QRD163J-183	CR	-
R175	" -682	"	-	R428	QRD167J-331	"	-
R176	" -682	"	-	R429	QRD163J-183	"	-
R177	" -183	"	-	R430	-	"	-
R178	" -183	"	-	R431	QRD163J-183	CR	-
R179	" -271	"	-	R432	" -183	"	-
R180	" -561	"	-	R433	" -103	"	-
R181	" -274	"	-	R434	" -103	"	-
R182	" -274	"	-	R435	" -822	"	-
R183	" -223	"	-	R436	" -822	"	-
R184	" -100	"	-	R437	" -822	"	-
R185	" -153	"	-	R438	" -822	"	-
R186	" -153	"	-	R439	" -822	"	-
R187	QVZ3507-154	VR	R-CH REC FM LEV	R440	" -822	"	-
R188	" -154	"	-	R441	" -822	"	-
R189	-	-	-	R442	" -822	"	-
R190	-	-	-	R443	QRD167J-122	"	-
R191	QRD167J-153	CR	SO-8	R444	" -122	"	-
R192	" -153	"	-	R445	QRD161J-223	"	-
R193	" -273	"	-	R446	" -223	"	-
R194	" -273	"	-				
R195	" -273	"	-				

FM AUDIO

Symbol No.	Part No.	Part Name	Description
C 1	QCS11HJ-221	C Cap	
C 2	" -221	"	
C 3	-	-	
C 4	-	-	
C 5	QFN41HJ-223	MY Cap	
C 6	" -223	"	
C 7	" -102	"	
C 8	" -102	"	
C 9	QER41HM-105	E Cap	
C10	" -105	"	
C11	QER40JM-336	"	
C12	QCF11HP-223	C Cap	
C13	QER40JM-336	E Cap	
C14	QCF11HP-223	C Cap	
C15	QFN41HJ-223	MY Cap	
C16	" -333	"	
C17	QCS11HJ-820	C Cap	
C18	QFN41HJ-223	MY Cap	
C19	QCS11HJ-331	C Cap	
C20	QFN41HJ-223	MY Cap	
C21	QER40JM-336	E Cap	
C22	QCF11HP-223	C Cap	
C23	QER40JM-476	E Cap	
C24	-	-	
C25	QEPA1HM-105	NP Cap	
C26	QFN41HJ-102	MY Cap	
C27	QER41CM-336	E Cap	
C28	QCF11HP-223	C Cap	
C29	QFN41HJ-223	MY Cap	
C30	QCS11HJ-270	C Cap	
C31	QER41HM-105	E Cap	
C32	QFN41HJ-223	MY Cap	
C33	" -223	"	
C34	QER41CM-106	E Cap	
C35	QER41EM-475	"	
C36	QER41CM-106	"	
C37	QER41EM-475	"	
C38	QEB41EM-475	"	
C39	-	-	
C40	QER41CM-476	E Cap	
C41	QER41AM-226	"	
C42	QER41CM-476	"	
C43	QEB41EM-475	"	
C44	-	-	
C45	QER41CM-476	E Cap	
C46	QER41AM-226	"	
C47	QER41CM-476	"	
C48	" -226	"	
C49	" -226	"	
C50	" -476	"	
C51	" -226	"	
C52	" -226	"	
C53	" -476	"	
C54	" -106	"	
C55	QFV41HJ-104	MY Cap	
C56	QEU41AM-107	E Cap	
C57	QER41CM-106	"	
C58	" -476	"	
C59	QER41AM-226	"	
C60	QER41CM-226	"	
C61	" -476	"	
C62	" -106	"	
C63	" -106	"	
C64	QFV41HJ-104	MY Cap	
C65	QEU41AM-107	E Cap	

Symbol No.	Part No.	Part Name	Description
C66	QER41AM-226	E Cap	
C67	QER41CM-226	"	
C68	QER41EM-475	"	
C69	QER41AM-226	"	
C70	QER41CM-476	"	
C71	QER41EM-475	"	
C72	QER41AM-475	"	
C73	QER41AM-226	"	
C74	QER41EM-475	"	
C75	-	-	
C76	QFN41HJ-223	MY Cap	
C77	QER40JM-476	E Cap	
C78	QER41AM-476	"	
C79	QFN41HJ-104	MY Cap	
C80	QCS11HJ-101	C Cap	
C81	QFN41HJ-332	MY Cap	
C82	QET41AM-476	E Cap	
C83	QER41CM-476	"	
C84	QFN41HJ-562	MY Cap	
C85	QER41CM-476	E Cap	
C86	QET41AM-476	"	
C87	QER40JM-226	"	
C88	" -476	"	
C89	QFN41HJ-103	MY Cap	
C90	QER41CM-476	E Cap	
C91	" -476	"	
C92	QFN41HJ-223	MY Cap	
C93	QCS11HJ-330	C Cap	
C94	" -820	"	
C95	QFN41HJ-223	MY Cap	
C96	QCS11HJ-101	C Cap	
C97	QER41HM-105	E Cap	
C98	QCT25CH-101	C Cap	
C99	QER41CM-106	E Cap	
C100	" -106	"	
C101	QER40JM-226	"	
C102	" -226	"	
C103	" -476	"	
C104	QER41AM-476	"	
C105	QFN41HJ-104	MY Cap	
C106	QCS11HJ-101	C Cap	
C107	QFN41HJ-332	MY Cap	
C108	QER41CM-476	E Cap	
C109	QET41AM-476	"	
C110	QFN41HJ-562	MY Cap	
C111	QET41AM-476	E Cap	
C112	QER40JM-226	"	
C113	QER41CM-476	"	
C114	QER40JM-476	"	
C115	QFN41HJ-103	MY Cap	
C116	QER41CM-476	E Cap	
C117	" -476	"	
C118	QFN41HJ-223	MY Cap	
C119	QCS11HJ-820	C Cap	
C120	QFM41HJ-223	MY Cap	
C121	QCS11HJ-820	C Cap	
C122	QER41HM-105	E Cap	
C123	QCT25CH-101	C Cap	
C124	QER41CM-106	E Cap	
C125	" -106	"	
C126	QER40JM-226	"	
C127	" -226	"	
C128	QER41EM-475	"	
C129	" -475	"	
C130	" -475	"	

Symbol No.	Part No.	Part Name	Description
C131	QER41HM-225	E Cap	
C132	QER41CM-226	"	
C133	QFN41HJ-102	MY Cap	
C134	" -273	"	
C135	" -102	"	
C136	" -273	"	
C137	QER41CM-476	E Cap	
C138	QCF11HP-223	C Cap	
C139	QEPA1EM-475	NP Cap	
C140	" -475	"	
C141	-	-	
C142	QCS11HJ-6R0	C Cap	
C143	-	-	
C144	QCS11HJ-6R0	C Cap	
C145	" -6R0	"	
C146	" -6R0	"	
C147	QFM41HJ-223	MY Cap	or QFN41HJ-223
C148	QER41CM-476	E Cap	
C149	" -106	"	
C150	" -476	"	
C151	" -226	"	
C152	" -226	"	
C153	" -476	"	
C154	-	-	
C155	QER41HM-334	E Cap	
C156	QFN41HJ-102	MY Cap	
C157	" -102	"	
C158	" -102	"	
C159	" -102	"	
C406	QEB41EM-475	E Cap	
C407	" -475	"	
C408	QER41CM-476	"	
C409	" -106	"	
C410	QEB41EM-475	"	
C411	-	-	
C412	-	-	
C413	-	-	
C414	-	-	
C415	-	-	
C416	QEB41EM-475	E Cap	
C417	" -475	"	
C418	QER41CM-476	"	
C419	" -106	"	
C420	QEB41EM-475	"	
C421	-	-	
C422	-	-	
C423	-	-	
C424	-	-	
C425	-	-	
C426	-	-	
C427	QFN41HJ-122	MY Cap	
C428	" -122	"	
C429	" -472	"	
C430	" -472	"	

Symbol No.	Part No.	Part Name	Description
L 1	PU53223-101JG	Peaking Coil	
L 2	" -101JG	"	
L 3	" -101JG	"	
L 4	" -221JG	"	
L 5	PU53607-152	Coil	
L 6	" -152	"	
L 7	PU53223-101JG	Peaking Coil	
L 8	" -101JG	"	
△ICP1	ICP-F10	Circuit Protector	
△ICP2	"	"	
BPF1	PU56177-3	Band Pass Filter	
BPF2	" 4	"	
BPF3	" 3	"	
T 1	PU56175	Transformer	
T 2	"	"	
RY1	PU55260	Relay	
CN 1	PU43351-6	Cap. Housing	
CN 2	" -2	"	
CN 3	" -3	"	
CN 4	" -2	"	
CN 5	" -3	"	
CN 6	" -2R	"	
CN 7	" -2Y	"	
CN 8	" -4R	"	
CN 9	" -2R	"	
CN10	" -3Y	"	
CN11	" -2	"	
CN12	" -4Y	"	
CN13	" -4	"	
CN14	" -2	"	
CN43	PU43351-3	Cap. Housing	
CN44	" -2	"	
CN45	" -2	"	
CN50	PU43351-2R	Cap. Housing	
CN51	" -2	"	
PU52104		Tapping Support	
PU54969-2		Wire Clamp	x 5
PGD40137		Shield Case (1)	
PGD40138		" (2)	
PGD40139		" (3)	
PU56008		Test Pin	TP1-37

6.2.3 Rear-1 board ass'y ①③ PGE30073A

Symbol No.	Part No.	Part Name	Description
Q 1	DTC144EF	D. Transistor	
R 1	QRD167J-750	CR	
⚠	PU49624-2	Varistor	V A1 → 2

6.2.6 Full erase head board ①⑥

Symbol No.	Part No.	Part Name	Description
	PU53259-1-2	Full Erase Head Board	
IC 1	3VT01	Integrated Circuit	
C 1	QFP42AG-363	P. Cap	

6.2.4 SW board ①④

Symbol No.	Part No.	Part Name	Description
	PGE20111-01-02	SW Board	
	PGZ00016	Slide Switch	S1-3, S5-7, S10
	PGZ00017	"	S4, S8, S9

6.2.5 VR board (1) ass'y ①⑤ PGE30049A1

Symbol No.	Part No.	Part Name	Description
R 1	QRD167J-391	CR	
R 2	QRD121J-151	"	
R 3	" -151	"	
R 4	-	-	
R 5	PGZ00023-002	VR	
R 6	" -003	"	
R 7	" -001	"	
R 8	-	-	
R 9	PGZ00023-001	VR	
R10	-	-	
R11	QRD161J-101	CR	
R12	" -101	"	
R13	" -101	"	
⚠ VA 1	PU49624-2	Varistor	
⚠ VA 2	" -2	"	
⚠ VA 3	" -2	"	
⚠ VA 4	" -2	"	
⚠ VA 5	" -2	"	
⚠ VA 6	" -2	"	
⚠ VA 7	" -2	"	
CN20	PU43351-102	Cap. Housing	
CN21	-	-	
CN22	PU49215-107	Cap. Housing	

6.2.7 Regulator board ass'y ① ⑦ PGE20007C

Symbol No.	Part No.	Part Name	Description
△IC 1	STR2012A	Integrated Circuit	
△IC 2	"	"	
△IC 3	"	"	
△IC 4	UPC7815H	"	
△IC 5	"	"	
△Q 1	2SD638R	Transistor	
△Q 2	2SD837Q	"	
△Q 3	2SB644R	"	
△DA1	RB601F	Diode Array	
△DA2	"	"	
D 1	RD12EB1	Zener Diode	
D 2	W03C	Diode	
D 3	RD15EB3	Zener Diode	
R 1	QRD167J-271	CR	
R 2	" -182	"	
R 3	" -272	"	
R 4	" -102	"	
R 5	" -472	"	
R 6	" -222	"	
R 7	" -102	"	
R 8	QVZ3506-331	VR	
△C 1	QFH52AM-224	MM Cap	
C 2	QEL71HR-478	E Cap	
C 3	QET41HM-107	"	
C 4	QET41AM-477	"	
C 5	QET41HM-107	"	
C 6	QET41EM-337	"	
C 7	QET41HM-107	"	
C 8	QET41EM-337	"	
C 9	" -337	"	
C10	QEL71VR-688	"	
C11	QET41EM-337	"	
△C12	QFH52AM-224	MM Cap	
C13	-	-	
C14	QET41CM-476	E Cap	
C15	QCF11HP-223	C Cap	
C16	QET41CM-476	E Cap	
C17	QCF11HP-223	C Cap	
C18	QET41CM-476	E Cap	
C19	" -106	"	
C20	" -476	"	
△C21	QFH52AM-224	MM Cap	
C22	QET41VM-227	E Cap	
C23	QET41EM-106	"	
C24	" -476	"	

Symbol No.	Part No.	Part Name	Description
C25	QET41EM-476	E Cap	
C26	QET41CM-476	"	
C27	QCF11HP-223	C Cap	
C28	QET41CM-227	E Cap	
C29	QCF11HP-223	C Cap	
△L 1	PGZ00139-331	Choke Coil	
△L 2	" -331	"	
△L 3	" -331	"	
△L 4	" -331	"	
△L 5	" -331	"	
△L 6	" -331	"	
△L 7	PU30284-1R	"	
△CN 1	PU50597-3	Cap. Housing	
△CN 2	" -3	"	
△CN 3	" -3	"	
△CN 4	PU43351-6	"	
CN 5	" -4Y	"	
CN 6	-	-	
CN 7	PU43351-2R	Cap. Housing	
CN 8	" -2	"	
CN 9	" -4	"	
CN10	" -9	"	
CN11	" -7	"	
CN12	" -3R	"	
CN13	" -2	"	
CN14	" -2	"	
CN15	" -2R	"	
CN16	-	-	
CN17	PU43351-2Y	Cap. Housing	
△CN18	" -2	"	
CN19	-	-	
CN20	PU43351-2Y	Cap. Housing	
CN21	" -2	"	
	PGD40059	Heat Sink	
	PGZ00074	Transistor Spacer	x 2
	SPSP3008Z	Screw	x 2
	SPSP3006Z	"	x 5
	PU56008	Test Pin	TP1-9
△	PU51212	Fuse Clip	x 20
The following fuses are not included in PGE20007C.			
△F002	QMF51E2-4R0	Fuse	
△F003	" -4R0	"	
△F004	" -R40	"	
△F005	" -1R25	"	
△F006	" -1R25	"	
△F007	" -1R0	"	
△F008	" -R80	"	
△F009	" -2R5	"	
△F010	" -2R0	"	
△F011	" -3R15	"	

6.2.8 Syscon board ass'y ① ⑧ PGE10032B

Symbol No.	Part No.	Part Name	Description
IC 1	HD14021B	Integrated Circuit	
IC 2	"	"	
IC 3	"	"	
IC 4	"	"	or TC4021BP, or UPD4021BC
IC 5	"	"	
IC 6	"	"	
IC 7	TC4066BP	"	
△ IC 8	HD6303RP	"	
IC 9	M74LS373P	"	or HD74LS373P
IC10	PGD30239-3-8	"	
IC11	HD6821P	"	
IC12	TD62703P	"	
IC13	M74LS20P	"	or HD74LS20P
IC14	M74LS08P	"	or HD74LS08P
IC15	M74LS04P	"	or HD74LS04P
IC16	15VT01	"	
IC17	TC4053BP	"	
IC18	"	"	
IC19	UPC1458C	"	
IC20	"	"	
△ IC21	UPC358C	"	
△ IC22	M54543L	"	
IC23	TC4011BP	"	
IC24	M50782SP	"	
IC25	"	"	
IC26	LM6417E-297	"	
IC27	TD62706P	"	
IC28	"	"	
IC29	"	"	
△ IC30	TC4011BP	"	
△ IC31	LM6416E-278	"	
IC32	M54519P	"	
IC33	"	"	
IC34	TC4081BP	"	
IC35	M54519P	"	
△ IC36	M54543L	"	
IC37	M54519P	"	
IC38	"	"	
IC39	M54533P	"	
IC40	TC4011BP	"	
IC41	UPD4584BC	"	
△ IC42	M50117AP	"	
IC43	TC4028BP	"	
IC44	TC4069UBP	"	
IC45	HD14021B	"	
IC46	"	"	
IC47	TC4001BP	"	
IC48	TC4066BP	"	
Q 1	—	—	
Q 2	DTC124EF	D. Transistor	
Q 3	"	"	
Q 4	DTA124EF	"	
Q 5	DTC124EF	"	
Q 6	"	"	
Q 7	"	"	
Q 8	2SD636Q,R	Transistor	
Q 9	"	"	
Q10	DTA124EF	D. Transistor	

Symbol No.	Part No.	Part Name	Description
Q11	DTA124EF	D. Transistor	
Q12	"	"	
Q13	DTC124EF	"	
Q14	"	"	
Q15	"	"	
Q16	DTA124EF	"	
Q17	DTC124EF	"	
Q18	DTA124EF	"	
Q19	"	"	
Q20	"	"	
Q21	"	"	
Q22	"	"	
△ Q23	2SB907	Transistor	
△ Q24	"	"	
△ Q25	"	"	
△ Q26	"	"	
△ Q27	"	"	
△ Q28	"	"	
Q29	DTC124EF	D. Transistor	
Q30	"	"	
Q31	"	"	
Q32	"	"	
Q33	"	"	
Q34	"	"	
Q35	DTA124EF	"	
Q36	DTC124EF	"	
Q37	"	"	
Q38	"	"	
Q39	"	"	
Q40	DTC124EF	D. Transistor	
Q41	DTC144EF	"	
D 1	RD5.1EB2	Zener Diode	
D 2	1SS133	Diode	
D 3	"	"	
D 4	"	"	
D 5	"	"	
D 6	"	"	
D 7	—	—	
D 8	1SS133	Diode	
D 9	RD2.4EB	Zener Diode	
D10	1SS133	Diode	
D11	"	"	
D12	"	"	
D13	"	"	
D14	"	"	
D15	"	"	
D16	"	"	
D17	—	—	
D18	—	—	
D19	1SS133	Diode	
D20	"	"	
D21	—	—	
D22	1SS133	Diode	
D23	"	"	
D24	"	"	
D25	"	"	

Symbol No.	Part No.	Part Name	Description
D26	1SS133	Diode	
D27	"	"	
D28	"	"	
D29	"	"	
D30	"	"	
D31	"	"	
D32	RD6.2EB2	Zener Diode	
D33	RD3.0EB2	"	
D34	"	"	
D35	"	"	
D36	1SS133	Diode	
D37	V03C	"	
D38	"	"	
D39	1SS133	"	
D40	V03C	"	
D41	"	"	
D42	1SS133	"	
D43	V03C	"	
D44	"	"	
D45	"	"	
D46	"	"	
D47	1SS133	"	
R 1	QRD167J-331	CR	
R 2	" -102	"	
R 3	" -104	"	
R 4	" -103	"	
R 5	" -103	"	
R 6	" -103	"	
R 7	" -103	"	
R 8	" -103	"	
R 9	" -103	"	
R10	" -103	"	
R11	" -103	"	
R12	" -103	"	
R13	" -103	"	
R14	" -103	"	
R15	" -103	"	
R16	" -103	"	
R17	" -103	"	
R18	" -222	"	
R19	" -222	"	
R20	" -222	"	
R21	" -222	"	
R22	" -103	"	
R23	" -103	"	
R24	" -103	"	
R25	" -104	"	
R26	" -104	"	
R27	" -333	"	
R28	" -103	"	
R29	" -151	"	
R30	" -184	"	
R31	" -472	"	
R32	" -224	"	
R33	" -222	"	
R34	" -222	"	
R35	QRD167J-103	CR	

Symbol No.	Part No.	Part Name	Description
R36	-	-	
R37	QRD167J-104	CR	
R38	" -104	"	
R39	" -103	"	
R40	" -103	"	
R41	" -103	"	
R42	" -103	"	
R43	" -473	"	
R44	" -104	"	
R45	" -124	"	
R46	" -124	"	
R47	" -103	"	
R48	" -103	"	
R49	" -103	"	
R50	" -103	"	
R51	" -103	"	
R52	" -103	"	
R53	" -103	"	
R54	" -103	"	
R55	" -104	"	
R56	" -152	"	
R57	" -103	"	
R58	" -681	"	
R59	" -103	"	
R60	" -154	"	
R61	" -103	"	
R62	" -104	"	
R63	" -104	"	
R64	" -104	"	
R65	" -104	"	
R66	" -332	"	
R67	" -332	"	
R68	" -333	"	
R69	" -333	"	
R70	" -182	"	
R71	" -822	"	
R72	" -104	"	
R73	" -104	"	
R74	QVP4A0B-223	VR	
R75	QRD167J-123	CR	
R76	" -562	"	
R77	QVP4A0B-103	VR	
R78	QRD167J-563	CR	
R79	" -391	"	
R80	" -333	"	
R81	" -333	"	
R82	" -333	"	
R83	" -333	"	
R84	" -473	"	
R85	" -104	"	
R86	" -104	"	
R87	" -104	"	
R88	-	-	
R89	QRD167J-103	CR	
R90	" -103	"	
R91	" -103	"	
R92	" -103	"	
R93	" -472	"	
R94	" -472	"	
R95	" -472	"	
R96	" -472	"	
R97	" -472	"	
R98	" -472	"	
R99	" -472	"	
R100	" -472	"	

SYSCON

Symbol No.	Part No.	Part Name	Description
R101	ORD167J-472	CR	
R102	" -472	"	
R103	" -472	"	
R104	" -472	"	
R105	" -472	"	
R106	" -472	"	
R107	" -472	"	
R108	" -472	"	
R109	" -472	"	
R110	" -472	"	
R111	" -472	"	
R112	" -472	"	
R113	" -472	"	
R114	" -103	"	
R115	" -104	"	
R116	" -103	"	
R117	" -473	"	
R118	" -221	"	
R119	" -221	"	
R120	" -221	"	
R121	-	-	
R122	QRD167J-222	CR	
R123	" -222	"	
R124	-	-	
R125	QRD167J-222	CR	
R126	" -222	"	
R127	" -222	"	
R128	" -104	"	
R129	" -684	"	
R130	" -564	"	
R131	" -104	"	
R132	" -105	"	
R133	" -473	"	
R134	" -104	"	
R135	" -104	"	
R136	" -222	"	
R137	" -222	"	
R138	" -222	"	
R139	" -222	"	
R140	" -222	"	
R141	" -222	"	
R142	" -222	"	
R143	" -222	"	
R144	" -222	"	
R145	" -473	"	
R146	" -473	"	
R147	" -473	"	
R148	" -473	"	
R149	" -473	"	
R150	" -473	"	
R151	" -681	"	
R152	" -272	"	
R153	-	-	
R154	QRD167J-473	CR	
R155	" -103	"	
R156	" -103	"	
R157	" -222	"	
R158	" -473	"	
R159	" -104	"	
R160	" -104	"	
R161	" -333	"	
R162	" -472	"	
R163	" -103	"	
R164	" -103	"	
R165	" -472	"	

Symbol No.	Part No.	Part Name	Description
R166	QRD167J-154	CR	
R167	" -103	"	
R168	" -103	"	
R169	" -103	"	
R170	" -104	"	
R171	" -103	"	
R172	" -104	"	
R173	" -104	"	
R174	" -223	"	
R175	" -224	"	
R176	" -473	"	
R177	" -273	"	
R178	" -104	"	
R179	" -103	"	
R180	" -121	"	
R181	" -104	"	
R182	" -224	"	
R183	" -224	"	
R184	" -473	"	
R185	" -473	"	
R186	" -121	"	
R187	" -103	"	
R188	" -103	"	
R189	" -103	"	
R190	" -103	"	
R191	" -0R0	"	
R192	" -103	"	
R193	" -104	"	
R194	" -153	"	
R195	" -472	"	
R196	" -823	"	
RA 1	EXB-P88104M	Resistor Array	
RA 2	"		
RA 3	"		
RA 4	EXB-P84104M		
RA 5	EXB-P88103M		
RA 6	EXB-P84104M		
RA 7	"		
RA 8	"		
C 1	QET41EM-476	E Cap	
C 2	QET41CM-476		
C 3	" -476		
C 4	" -226		
C 5	QFN41HK-103	MY Cap	
C 6	" -103		
C 7	" -103		
C 8	" -103		
C 9	" -103		
C10	QFN41HJ-183		

Symbol No.	Part No.	Part Name	Description
C11	QFN41HK-154	MY Cap	
C12	" -103	"	
C13	QET41EM-475	E Cap	
C14	QET41HM-225	"	
C15	QCF11HP-473	C Cap	
C16	QCS11HJ-220	"	
C17	" -220	"	
C18	QCF11HP-473	"	
C19	" -473	"	
C20	" -473	"	
C21	" -473	"	
C22	-	-	
C23	QET41HM-105	E Cap	
C24	-	-	
C25	QCF11HP-473	C Cap	
C26	QFN41HK-104	MY Cap	
C27	QCS11HJ-101	C Cap	
C28	QCF11HP-472	"	
C29	" -472	"	
C30	-	-	
C31	QCF11HP-473	C Cap	
C32	QCS11HJ-101	"	
C33	" -101	"	
C34	QET41CM-476	E Cap	
C35	QCS11HJ-221	C Cap	
C36	QET41CM-106	E Cap	
C37	" -106	"	
C38	" -106	"	
C39	QET41HM-105	"	
C40	" -105	"	
C41	QCF11HP-223	C Cap	
C42	" -223	"	
C43	QFN41HK-154	MY Cap	
C44	QET41CM-227	E Cap	
C45	QCF11HP-103	C Cap	
C46	QFN41HK-182	MY Cap	
C47	" -124	"	
C48	QCS11HJ-101	C Cap	
C49	" -101	"	
C50	QET41CM-227	E Cap	
C51	QCF11HP-103	C Cap	
C52	QET41CM-107	E Cap	
C53	QCF11HP-103	C Cap	
C54	-	-	
C55	-	-	
C56	-	-	
C57	-	-	
C58	-	-	
C59	QFN41HJ-103	MY Cap	
C60	" -103	"	
L 1	PU48530-271J	Coil	
L 2	" -271J	"	
L 3	" -271J	"	

Symbol No.	Part No.	Part Name	Description
S 1	PGZ00096-104	Dip Switch	
S 2	" -108	"	
S 3	" -104	"	
	PGZ00003-2	IC Socket	for IC10
	PGZ00083	"	
	PGZ00331	"	
△ X'TAL1	PU47931	Crystal	
△ CF 1	PU54060	Ceramic Filter	
△ CF 2	PU49487	"	
CN 1	PU43351-4	Cap. Housing	
CN 2	" -9	"	
CN 3	" -8R	"	
CN 4	" -11Y	"	
CN 5	" -2	"	
CN 6	" -2R	"	
CN 7	" -10	"	
CN 8	" -3	"	
CN 9	" -9	"	
CN10	" -7	"	
CN11	" -10	"	
CN12	" -9R	"	
CN13	" -9	"	
CN14	" -12	"	
CN15	-	-	
CN16	PU43351-7	Cap. Housing	
CN17	" -8	"	
CN18	" -7	"	
CN19	" -3	"	
CN20	" -3R	"	
CN21	" -3Y	"	
CN22	" -3	"	
CN23	" -2	"	
CN24	" -12R	"	
CN25	" -2	"	
CN26	" -7	"	
CN27	" -9Y	"	
CN28	" -6	"	
CN29	" -7	"	
CN30	-	-	
CN31	PU43351-7R	Cap. Housing	
	PGD30111	Syscon PWB Stay (1)	
	PGD30112	" (2)	
	GBST3006Z	Screw	x 6
	PU54969-2	Wire Clamp	
	PU57545	Test Pin	TP1-4

6.2.9 PRE/REC board ass'y [9] PGE20103A-03

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
IC 1	AN6392	Integrated Circuit		D 1	ISS133	Diode	
IC 2	"	"		D 2	"	"	
IC 3	HA11782	"		D 3	"	"	
IC 4	BA7021	"		D 4	"	"	
IC 5	HA11782	"		D 5	ISS133	Diode	
IC 6	TC4011BP	"		D 6	"	"	
IC 7	BA7036LS	"		D 7	"	"	
IC 8	TC4013BP	"		D 8	MA27W(A)	"	
IC 9	TC4538BP	"		D 9	"	"	
IC10	M4030BP	"		R 1	QVZ3506-102	VR	
IC11	TC4538BP	"		R 2	" -102	"	
IC12	SN74LS628N	"		R 3	QRD161J-222	CR	
IC13	MN3801	"		R 4	" -222	"	
IC14	"	"		R 5	" -121	"	
IC15	AN607P	"		R 6	" -820	"	
				R 7	QRD161J-561	"	
Q 1	DTC114EF	D. Transistor		R 8	" -393	"	
Q 2	"	"		R 9	" -331	"	
Q 3	2SB643R	Transistor		R10	QVZ3506-102	VR	
Q 4	DTA144EF	D. Transistor		R11	" -102	"	
Q 5	"	"		R12	QRD161J-222	CR	
Q 6	DTA114EF	"		R13	" -222	"	
Q 7	"	"		R14	" -121	"	
Q 8	DTA144EF	"		R15	" -820	"	
Q 9	2SC2647C	Transistor		R16	QRD161J-561	"	
Q10	"	"		R17	" -393	"	
Q11	"	"		R18	" -331	"	
Q12	"	"		R19	" -222	"	
Q13	"	"		R20	" -103	"	
Q14	2SB641Q	"		R21	" -103	"	
Q15	2SC2647C	"		R22	" -222	"	
Q16	"	"		R23	" -103	"	
Q17	"	"		R24	" -103	"	
Q18	"	"		R25	" -103	"	
Q19	"	"		R26	" -390	"	
Q20	"	"		R27	" -390	"	
Q21	DTC114EF	D. Transistor		R28	" -3R9	"	
Q22	"	"		R29	" -3R9	"	
Q23	"	"		R30	" -122	"	
Q24	"	"		R31	" -122	"	
Q25	DTC144EF	"		R32	" -122	"	
Q26	DTC114EF	"		R33	" -122	"	
Q27	"	"		R34	" -223	"	
Q28	2SB641Q	Transistor		R35	" -223	"	
Q29	"	"		R36	-	-	
Q30	2SC2647C	"		R37	-	-	
Q31	2SB641Q	"		R38	QVZ3506-222	VR	
Q32	"	"		R39	" -222	"	
Q33	2SC2647C	"		R40	-	-	
Q34	"	"		R41	-	-	
Q35	"	"		R42	QRD161J-333	CR	
Q36	DTA114EF	D. Transistor		R43	" -101	"	
Q37	DTC144EF	"		R44	QVZ3506-103	VR	
Q38	2SB641Q	Transistor		R45	QRD161J-473	CR	
Q39	2SC2647C	"		R46	" -222	"	
Q40	2SB641Q	"		R47	" -393	"	
Q41	"	"		R48	" -101	"	
				R49	" -122	"	
				R50	" -821	"	

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
R51	QRD161J-222	CR		R116	QRD161J-681	CR	
R52	-	-	-	R117	" -222	"	-
R53	-	-	-	R118	" -682	"	-
R54	QRD161J-183	CR		R119	" -222	"	-
R55	" -563	"	-	R120	" -223	"	-
R56	" -101	"	-	R121	" -273	"	-
R57	" -221	"	-	R122	" -123	"	-
R58	" -272	"	-	R123	QVZ3506-223	VR	
R59	" -103	"	-	R124	QRD161J-273	CR	
R60	" -563	"	-	R125	" -223	"	-
R61	" -471	"	-	R126	" -273	"	-
R62	QVZ3506-222	VR		R127	" -123	"	-
R63	QRD161J-102	CR		R128	QVZ3506-223	VR	
R64	" -221	"	-	R129	QRD161J-273	CR	
R65	" -101	"	-	R130	" -101	"	-
R66	QVZ3506-222	VR		R131	" -152	"	-
R67	QRD161J-471	CR		R132	" -392	"	-
R68	" -221	"	-	R133	" -331	"	-
R69	" -183	"	-	R134	" -472	"	-
R70	" -563	"	-	R135	QVZ3506-222	VR	
R71	" -152	"	-	R136	QRD161J-102	CR	
R72	" -561	"	-	R137	" -222	"	-
R73	" -681	"	-	R138	" -102	"	-
R74	" -102	"	-	R139	" -103	"	-
R75	" -102	"	-	R140	" -103	"	-
R76	" -103	"	-	R141	QRD161J-102	"	-
R77	" -3R9	"	-	R142	QRD161J-102	"	-
R78	" -3R9	"	-	R143	QVZ3506-102	VR	
R79	" -223	"	-	R144	QRD161J-333	CR	
R80	" -223	"	-	R145	" -183	"	-
R81	QVZ3506-222	VR		R146	" -102	"	-
R82	" -222	"	-	R147	" -102	"	-
R83	-	-	-	R148	" -560	"	-
R84	-	-	-	R149	QVZ3506-222	VR	
R85	QRD161J-333	CR		R150	QRD161J-103	CR	
R86	" -101	"	-	R151	" -103	"	-
R87	QVZ3506-103	VR		R152	" -392	"	-
R88	QRD161J-103	CR		R153	-	-	-
R89	" -103	"	-	R154	-	-	-
R90	" -103	"	-	R155	-	-	-
R91	" -103	"	-	R156	QRD161J-103	CR	
R92	" -124	"	-	R157	" -101	"	-
R93	" -103	"	-	R158	" -102	"	-
R94	" -103	"	-	R159	" -563	"	-
R95	" -103	"	-	R160	" -333	"	-
R96	" -103	"	-	R161	" -102	"	-
R97	" -103	"	-	R162	QVZ3506-681	VR	
R98	" -103	"	-	R163	QRD161J-102	CR	
R99	" -103	"	-	R164	" -102	"	-
R100	" -563	"	-	R165	-	-	-
R101	QVZ3507-154	VR		R166	QRD161J-102	CR	
R102	QRD161J-103	CR		R167	-	-	-
R103	" -333	"	-	R168	QRD161J-563	CR	
R104	" -103	"	-	R169	" -103	"	-
R105	" -334	"	-	R170	" -102	"	-
R106	" -103	"	-	R171	" -471	"	-
R107	" -103	"	-	R172	" -102	"	-
R108	-	-	-	R173	" -102	"	-
R109	-	-	-	R174	" -562	"	-
R110	QVZ3506-222	VR		R175	" -562	"	-
R111	" -222	"	-				
R112	QRD161J-472	CR					
R113	" -472	"	-				
R114	" -333	"	-				
R115	" -333	"	-				

PRE/REC

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
C 1	QCF31HP-223	C Cap		C66	-		
C 2	" -223	"		C67	-		
C 3	QCS31HJ-220	"		C68	-		
C 4	QET61HM-105	E Cap		C69	-		
C 5	QCF31HP-103	C Cap		C70	QCF31HP-223	C Cap	
C 6	QET61CM-106	E Cap		C71	" -223	"	
C 7	QCF31HP-223	C Cap		C72	QET60JM-476	E Cap	
C 8	QET61AM-476	E Cap		C73	QCF31HP-223	C Cap	
C 9	QCF31HP-223	C Cap		C74	" -223	"	
C10	" -223	"		C75	" -223	"	
C11	QCS31HJ-220	"		C76	" -223	"	
C12	QET61HM-105	E Cap		C77	QET60JM-476	E Cap	
C13	QCF31HP-103	C Cap		C78	QCF31HP-223	C Cap	
C14	QET61CM-106	E Cap		C79	" -223	"	
C15	QCF31HP-223	C Cap		C80	QCS31HJ-470	"	
C16	QET61AM-476	E Cap		C81	" -391	"	
C17	QCF31HP-223	C Cap		C82	QET61CM-106	E Cap	
C18	QET61AM-476	E Cap		C83	" -106	"	
C19	QCF31HP-223	C Cap		C84	QCS31HJ-391	C Cap	
C20	QET60JM-476	E Cap		C85	" -470	"	
C21	QET61HM-105	"		C86	QCF31HP-223	"	
C22	" -105	"		C87	" -223	"	
C23	QCF31HP-223	C Cap		C88	" -223	"	
C24	" -223	"		C89	QET60JM-476	E Cap	
C25	" -223	"		C90	QCF31HP-223	C Cap	
C26	" -223	"		C91	QCS31HJ-101	"	
C27	" -223	"		C92	QFN31HK-683	MY Cap	
C28	" -223	"		C93	" -152	"	
C29	QAT3001-017	T Cap		C94	-		
C30	" -017	"		C95	QET60JM-476	E Cap	
C31	-	-		C96	QCF31HP-223	C Cap	
C32	-	-		C97	QCS31HJ-101	"	
C33	QCF31HP-223	C Cap		C98	QFN31HK-122	MY Cap	
C34	-	-		C99	QCS31HJ-470	C Cap	
C35	-	-		C100	QET60JM-476	E Cap	
C36	QCF31HP-223	C Cap		C101	QCF31HP-223	C Cap	
C37	QET60JM-476	E Cap		C102	QET61AM-336	E Cap	
C38	QCF31HP-223	C Cap		C103	QCF31HP-223	C Cap	
C39	" -223	"		C104	" -103	"	
C40	" -223	"		C105	" -103	"	
C41	" -223	"		C106	" -103	"	
C42	QET60JM-476	E Cap		C107	" -103	"	
C43	QCF31HP-223	C Cap		C108	-		
C44	QET60JM-476	E Cap		C109	QCF31HP-103	C Cap	
C45	QCF31HP-223	C Cap		C110	" -103	"	
C46	" -103	"		C111	" -103	"	
C47	QCS31HJ-390	"		C112	QET60JM-476	E Cap	
C48	QCF31HP-103	"		C113	QCF31HP-223	C Cap	
C49	QCS31HJ-100	"		C114	" -223	"	
C50	" -390	"		C115	" -103	"	
C51	QCF31HP-103	"		C116	" -103	"	
C52	QET60JM-476	E Cap		C117	" -103	"	
C53	QCF31HP-223	C Cap		C118	" -103	"	
C54	QET60JM-476	E Cap		C119	" -103	"	
C55	QCF31HP-223	C Cap		C120	" -103	"	
C56	QCS31HJ-821	"		C121	" -103	"	
C57	QCF31HP-223	"		C122	QET60JM-476	E Cap	
C58	QCS31HJ-820	"		C123	QCF31HP-223	C Cap	
C59	" -820	"		C124	" -223	"	
C60	QCF31HP-223	"		C125	" -223	"	
C61	" -223	"		C126	" -103	"	
C62	QET61HM-105	E Cap		C127	" -103	"	
C63	" -105	"		C128	QCS31HJ-220	"	
C64	QAT3001-017	T Cap		C129	" -220	"	
C65	" -017	"		C130	QFN31HK-562	MY Cap	

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
C131	QCF31HP-223	C Cap		SW 1	PU49847	Slide Switch	
C132	QET60JM-476	E Cap		CN 1	PU43351-2Y	Cap. Housing	
C133	QCF31HP-223	C Cap		CN 2	" -2	"	
C134	QCS31HJ-151	"		CN 3	-	-	
C135	QCF31HP-223	"		CN 4	-	-	
C136	" -223	"		CN 5	-	-	
C137	" -223	"		CN 6	-	-	
C138	QFN31HK-103	MY Cap		CN 7	PU43351-4R	Cap. Housing	
C139	QCF31HP-223	C Cap		CN 8	" -6	"	
C140	QCS31HJ-220	"		CN 9	-	-	
C141	" -220	"		CN10	PU43351-2R	Cap. Housing	
C142	QCF31HP-223	"		CN11	" -2	"	
C143	-	-		CN12	" -5R	"	
C144	-	-		CN13	" -4	"	
C145	-	-		CN14	" -2R	"	
C146	QET61HM-105	E Cap		CN15	" -2Y	"	
C147	QCS31HJ-101	C Cap		CN16	" -2Y	"	
C148	" -330	"					
C149	" -330	"					
C150	" -330	"					
C151	" -330	"					
C152	QCF31HP-223	"					
C153	QFN31HK-103	MY Cap					
C154	" -124	"					
C155	QCF11HP-223	C Cap					
C156	" -223	"					
EQ 1	PU48515-2	Equalizer					
LPF 1	PU48517-4	Low Pass Filter					
L 1	PU48530-221J	Peaking Coil					
L 2	" -221J	"					
L 3	PGZ00653-100K	"					
L 4	" -100K	"					
L 5	PU48530-221J	"					
L 6	" -221J	"					
L 7	" -221J	"					
L 8	" -820J	"					
L 9	" -560J	"					
L10	" -270J	"					
L11	" -221J	"					
L12	" -560J	"					
L13	" -221J	"					
L14	" -221J	"					
L15	" -221J	"					
L16	" -220J	"					
L17	" -220J	"					
L18	" -221J	"					
L19	" -221J	"					
L20	" -221J	"					
L21	" -221J	"					
L22	" -221J	"					
L23	" -221J	"					
L24	" -560J	"					
L25	" -821J	"					
L26	" -221J	"					
L27	" -470K	"					
L28	-	-					
L29	PU48530-150K	Peaking Coil					
L30	" -150K	"					
L31	" -150K	"					
L32	" -150K	"					
L33	" -150K	"					

6.2.10 Color board ass'y [10] PGA20104A-03

Symbol No.	Part No.	Part Name	Description
IC 1	BA7021	Integrated Circuit	
IC 2	AN607P	"	
IC 3	HA11756	"	
IC 4	TA78009AP	"	
IC 5	TA78005AP	"	
IC 6	BA7021	"	
IC 7	"	"	
IC 8	"	"	
IC 9	BA401	"	
IC10	"	"	
IC11	AN607P	"	
IC12	BA7021	"	
IC13	AN607P	"	
IC14	"	"	
IC15	BA401	"	
IC16	AN614	"	
IC17	BA7021	"	
IC18	UPD4528BC	"	
IC19	AN607P	"	
Q 1	2SC2647C	Transistor	
Q 2	"	"	
Q 3	"	"	
Q 4	"	"	
Q 5	2SB761P,Q	"	
Q 6	-	-	
Q 7	DTA114EF	D. Transistor	
Q 8	"	"	
Q 9	"	"	
Q10	2SC2647C	Transistor	
Q11	2SB641Q	"	
Q12	"	"	
Q13	DTC114EF	D. Transistor	
Q14	2SC2647C	Transistor	
Q15	"	"	
Q16	"	"	
Q17	"	"	
Q18	"	"	
Q19	DTC114EF	D. Transistor	
Q20	2SC2647C	Transistor	
Q21	DTC144EF	D. Transistor	
Q22	2SC2647C	Transistor	
Q23	2SK30A-OY	"	
Q24	2SC2647C	"	
Q25	"	"	
Q26	2SB641Q	"	
Q27	2SC2647C	"	
Q28	"	"	
Q29	"	"	
Q30	"	"	
Q31	"	"	
Q32	2SB641Q	"	
Q33	DTC114EF	D. Transistor	
Q34	2SB641Q	Transistor	
Q35	2SC2647C	"	
Q36	"	"	
Q37	"	"	
Q38	"	"	
Q39	"	"	
Q40	"	"	

Symbol No.	Part No.	Part Name	Description
Q41	2SC2647C	Transistor	
Q42	"	"	
Q43	"	"	
Q44	"	"	
Q45	"	"	
Q46	"	"	
Q47	"	"	
Q48	"	"	
Q49	DTC114EF	D. Transistor	
Q50	"	"	
Q51	2SC2647C	Transistor	
Q52	-	-	
Q53	2SC2647C	Transistor	
Q54	"	"	
Q55	"	"	
Q56	"	"	
Q57	"	"	
Q58	"	"	
Q59	"	"	
Q60	"	"	
Q61	-	-	
Q62	2SC2647C	Transistor	
Q63	"	"	
Q64	"	"	
Q65	"	"	
Q66	DTC144EF	D. Transistor	
Q67	"	"	
Q68	2SC2647C	Transistor	
Q69	DTC144EF	D. Transistor	
Q70	"	"	
Q71	2SB643R	Transistor	
D 1	1SS133	Diode	
D 2	"	"	
D 3	"	"	
D 4	"	"	
D 5	"	"	
D 6	"	"	
D 7	"	"	
D 8	MA27W(A)	"	
D 9	1SS93	"	
D10	"	"	
D11	"	"	
D12	"	"	
D13	RD3.3EB2	Z. Diode	
D14	1SS135	Diode	
D15	"	"	
D16	1SS133	"	
D17	"	"	
D18	"	"	
D19	"	"	
D20	"	"	
D21	"	"	
D22	"	"	
D23	"	"	
D24	"	"	
D25	"	"	
D26	"	"	
D27	"	"	
D28	"	"	
D29	"	"	
D30	"	"	
D31	"	"	
D32	"	"	
D33	"	"	
D34	"	"	
D35	"	"	

COLOR

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
R 1	QRD161J-681	CR		R66	QVZ3506-223	VR	
R 2	" -682	"		R67	" -223	"	
R 3	" -123	"		R68	" -103	"	
R 4	" -102	"		R69	QRD161J-102	CR	
R 5	" -391	"		R70	" -274	"	
R 6	" -681	"		R71	" -472	"	
R 7	" -122	"		R72	" -332	"	
R 8	" -223	"		R72	QRV143F-3241	"	
R 9	QVZ3506-102	VR		R73	" -102	"	
R10	" -102	"		R74	-	-	
R11	" -222	"		R75	QRD167J-331	CR	
R12	QRD161J-560	CR		R76	" -681	"	
R13	" -153	"		R77	-	-	
R14	" -102	"		R79	" -103	"	
R15	" -153	"		R80	" -103	"	
R16	" -332	"		R81	" -103	"	
R17	" -102	"		R82	" -562	"	
R18	" -102	"		R83	" -102	"	
R19	" -103	"		R84	" -562	"	
R20	" -104	"		R85	" -272	"	
R21	" -153	"		R86	QRD167J-821	"	
R22	QRD167J-223	"		R87	-	-	
R23	" -122	"		R88	QRD161J-562	CR	
R24	" -122	"		R89	" -151	"	
R25	" -153	"		R90	QRD167J-152	"	
R26	" -822	"		R91	-	-	
R27	" -102	"		R92	QRD161J-682	CR	
R28	" -101	"		R93	" -123	"	
R29	" -101	"		R94	QRD167J-472	"	
R30	" -103	"		R95	QRD161J-102	"	
R31	" -103	"		R96	QRD167J-471	"	
R32	" -103	"		R97	" -153	"	
R33	" -393	"		R98	" -223	"	
R34	" -102	"		R99	" -152	"	
R35	" -223	"		R100	" -681	"	
R36	" -222	"		R101	QVZ3506-681	VR	
R37	" -102	"		R102	QRD161J-820	CR	
R38	" -102	"		R103	" -391	"	
R39	" -101	"		R104	" -391	"	
R40	QVZ3506-102	VR		R105	" -102	"	
R41	QRD161J-103	CR		R106	" -471	"	
R42	" -222	"		R107	" -103	"	
R43	" -103	"		R108	" -223	"	
R44	QVZ3506-222	VR		R109	" -221	"	
R45	QRD161J-103	CR		R110	" -152	"	
R46	-	-		R111	" -102	"	
R47	QVZ3506-102	VR		R112	" -152	"	
R48	QRD161J-103	CR		R113	" -561	"	
R49	" -682	"		R114	QRD167J-222	CR	
R50	" -562	"		R115	QRD161J-222	CR	
R51	" -103	"		R116	" -152	"	
R52	-	-		R117	" -561	"	
R53	QRD161J-103	CR		R118	" -561	"	
R54	" -103	"		R119	" -222	"	
R55	" -103	"		R120	" -101	"	
R56	" -223	"		R121	" -103	"	
R57	" -223	"		R122	" -103	"	
R58	" -271	"		R123	" -103	"	
R59	" -331	"		R124	-	-	
R60	" -222	"		R125	QRD161J-681	CR	
R61	" -222	"		R126	" -102	"	
R62	-	-		R127	" -102	"	
R63	QRD161J-473	CR		R128	" -102	"	
R64	" -274	"		R129	" -102	"	
R65	" -103	"		R130	" -561	"	

COLOR

Symbol No.	Part No.	Part Name	Description
R131	QVZ3506-222	VR	VR
R132	QRD161J-332	CR	CR
R133	" -103	"	"
R134	" -103	"	"
R135	QVZ3506-682	VR	VR
R136	QRD161J-101	CR	CR
R137	QVZ3506-103	VR	VR
R138	QRD161J-221	CR	CR
R139	" -103	"	"
R140	" -103	"	"
R141	" -103	"	"
R142	" -103	"	"
R143	" -560	"	"
R144	QRD167J-391	"	"
R145	QRD161J-473	"	"
R146	" -473	"	"
R147	" -152	"	"
R148	QVZ3506-102	VR	VR
R149	QRD161J-332	CR	CR
R150	" -152	"	"
R151	" -221	"	"
R152	" -332	"	"
R153	" -561	"	"
R154	QVZ3506-222	VR	VR
R155	-	-	-
R156	QRD161J-102	CR	CR
R157	" -272	"	"
R158	" -472	"	"
R159	" -103	"	"
R160	" -223	"	"
R161	" -103	"	"
R162	" -472	"	"
R163	" -102	"	"
R164	" -102	"	"
R165	" -102	"	"
R166	" -181	"	"
R167	" -102	"	"
R168	" -333	"	"
R169	" -333	"	"
R170	" -102	"	"
R171	" -560	"	"
R172	QVZ3506-222	VR	VR
R173	QRD161J-102	CR	CR
R174	QVZ3506-102	VR	VR
R175	QRD161J-102	CR	CR
R176	" -103	"	"
R177	" -471	"	"
R178	" -103	"	"
R179	" -103	"	"
R180	-	-	-
R181	QRD161J-750	CR	CR
R182	" -821	"	"
R183	" -223	"	"
R184	" -223	"	"
R185	" -222	"	"
R186	QVZ3506-331	VR	VR
R187	QRD161J-332	CR	CR
R188	" -152	"	"
R189	" -223	"	"
R190	" -223	"	"
R191	" -471	"	"
R192	" -102	"	"
R193	" -223	"	"
R194	" -223	"	"
R195	" -103	"	"

Symbol No.	Part No.	Part Name	Description
R196	QRD161J-562	CR	CR
R197	" -562	"	"
R198	" -333	"	"
R199	" -103	"	"
R200	" -103	"	"
R201	" -102	"	"
R202	" -102	"	"
R203	" -103	"	"
R204	" -182	"	"
R205	" -104	"	"
R206	" -103	"	"
R207	" -562	"	"
R208	QVZ3506-104	VR	VR
R209	QRD161J-562	CR	CR
R210	" -103	"	"
R211	QVZ3506-104	VR	VR
R212	QRD161J-103	CR	CR
R213	" -392	"	"
R214	" -392	"	"
R215	" -103	"	"
R216	" -103	"	"
R217	" -103	"	"
R218	" -102	"	"
R219	" -680	"	"
R220	" -102	"	"
R221	" -103	"	"
R222	" -102	"	"
R223	" -182	"	"
R224	" -103	"	"
R225	" -223	"	"
R226	" -103	"	"
R227	" -103	"	"
R228	" -223	"	"
R229	-	-	-
R230	-	-	-
R231	-	-	-
R232	QRD161J-473	CR	CR
R233	" -473	"	"
R234	" -102	"	"
R235	" -332	"	"
R236	" -272	"	"
R237	" -562	"	"
R238	" -560	"	"
R239	" -821	"	"
R240	" -473	"	"
R241	" -103	"	"
R242	" -152	"	"
R243	" -103	"	"
R244	" -153	"	"
R245	" -822	"	"
R246	" -471	"	"
R247	" -471	"	"
R248	-	-	-
R249	QRD161J-122	CR	CR
R250	" -472	"	"
R251	" -123	"	"
R265	" -561	"	"
R266	" -332	"	"
R267	" -222	"	"
R268	" -102	"	"
C 1	QCS31HJ-560	C Cap	C Cap
C 2	" -560	"	"
C 3	QCF31HP-103	"	"
C 4	QCS31HJ-101	"	"
C 5	QET60JM-476	E Cap	E Cap
C 6	QCF31HP-223	C Cap	C Cap
C 7	QET61CM-226	"	"
C 8	QCF31HP-103	"	"
C 9	QET61CM-476	"	"
C10	QCS31HJ-151	"	"

COLOR

Symbol No.	Part No.	Part Name	Description
C11	QET61CM-106	E Cap	
C12	QCF31HP-223	C Cap	
C13	QET60JM-476	E Cap	
C14	QCF31HP-103	C Cap	
C15	QFN31HK-102	MY Cap	
C16	QCS31HJ-680	C Cap	
C17	QET61EM-475	E Cap	
C18	QFN31HK-562	MY Cap	
C19	QCF31HP-103	C Cap	
C20	QET61EM-475	E Cap	
C21	QCF31HP-223	C Cap	
C22	" -223	"	
C23	" -103	"	
C24	QET60JM-476	E Cap	
C25	QCF31HP-223	C Cap	
C26	QET61CM-476	E Cap	
C27	QET61AM-476	"	
C28	QET61CM-476	"	
C29	QET60JM-107	"	
C30	" -476	"	
C31	QCF31HP-223	C Cap	
C32	" -223	"	
C33	-	-	
C34	QET61HM-105	E Cap	
C35	QET60JM-476	"	
C36	QCF31HP-223	C Cap	
C37	QET61HM-105	E Cap	
C38	QCF31HP-223	C Cap	
C39	QET60JM-476	E Cap	
C40	QET41CM-106	E Cap	
C41	QET61CM-226	C Cap	
C42	" -226	"	
C43	QET61HM-105	E Cap	
C44	QCF31HP-223	C Cap	
C45	QET60JM-476	E Cap	
C46	QCS31HJ-331	C Cap	
C47	QET61CM-476	E Cap	
C48	QET61HM-335	"	
C49	" -335	"	
C50	" -105	"	
C51	QET60JM-227	"	
C52	QCF31HP-223	C Cap	
C53	QFN31HK-224	MY Cap	
C54	QCF31HP-103	C Cap	
C55	" -223	"	
C56	QFN31HK-472	MY Cap	
C57	" -223	"	
C58	QFN41HK-124	"	
C59	-	-	
C60	QCS31HJ-180	C Cap	
C61	" -180	"	
C62	" -470	"	
C63	QET61CM-106	E Cap	
C64	QFN31HK-104	MY Cap	
C65	QFN41HK-222	"	
C66	QCF31HP-223	C Cap	
C67	QET61AM-336	E Cap	
C68	QET61CM-106	"	
C69	" -106	"	
C70	QFN31HK-333	MY Cap	
C71	" -333	"	
C72	QET60JM-476	E Cap	
C73	QCF31HP-223	C Cap	
C74	" -223	"	
C75	QET61HM-225	E Cap	

Symbol No.	Part No.	Part Name	Description
C76	QCF31HP-223	C Cap	
C77	" -223	"	
C78	QET60JM-476	E Cap	
C79	QCF31HP-223	C Cap	
C80	-	-	
C81	QCS31HJ-221	C Cap	
C82	QCF31HP-103	"	
C83	" -103	"	
C84	" -103	"	
C85	" -472	"	
C86	" -103	"	
C87	" -223	"	
C88	QET60JM-476	E Cap	
C89	QET61CM-476	"	
C90	QCF31HP-103	C Cap	
C91	QET61CM-476	E Cap	
C92	QCF31HP-223	C Cap	
C93	QCS31HJ-391	"	
C94	QCF31HP-223	"	
C95	" -223	"	
C96	QET60JM-476	E Cap	
C97	QET61HM-225	"	
C98	QET61CM-476	C Cap	
C99	QCF31HP-223	C Cap	
C100	QET41AM-477	E Cap	
C101	QET60JM-476	"	
C102	QCF31HP-103	C Cap	
C103	" -103	"	
C104	" -103	"	
C105	" -103	"	
C106	" -223	"	
C107	QET60JM-476	E Cap	
C108	QCF31HP-103	C Cap	
C109	" -223	"	
C110	QET60JM-476	E Cap	
C111	QCF31HP-223	C Cap	
C112	QCS31HJ-390	"	
C113	QET61CM-106	E Cap	
C114	QCF31HP-103	C Cap	
C115	QET61HM-335	E Cap	
C116	QCF31HP-103	C Cap	
C117	QET60JM-476	E Cap	
C118	QCS31HJ-471	C Cap	
C119	QCF31HP-223	"	
C120	QET60JM-476	E Cap	
C121	QCF31HP-223	C Cap	
C122	" -223	"	
C123	QCS31HJ-101	"	
C124	QET61CM-226	"	
C125	QCF31HP-223	"	
C126	QET60JM-476	E Cap	
C127	QCF31HP-103	C Cap	
C128	QET61CM-226	"	
C129	QFN31HK-823	MY Cap	
C130	QET60JM-476	E Cap	
C131	QCF31HP-223	C Cap	
C132	QET60JM-476	E Cap	
C133	QCS31HJ-821	C Cap	
C134	QET60JM-476	E Cap	
C135	QCF31HP-223	C Cap	
C136	QET61CM-106	E Cap	
C137	QET61HM-105	"	
C138	QET61AM-107	"	
C139	QET60JM-476	"	
C140	QFN31HK-683	MY Cap	

COLOR

Symbol No.	Part No.	Part Name	Description
C141	QFN31HK-333	MY Cap	
C142	" -473	"	
C143	QET60JM-476	E Cap	
C144	QCF31HP-223	C Cap	
C145	" -223	"	
C146	QET41CM-106	E Cap	
C147	QET61HM-105	"	
C148	QET60JM-476	"	
C149	QCF31HP-223	C Cap	
C150	-	-	
C151	-	-	
C152	-	-	
C153	QET61HM-105	E Cap	
C154	" -105	"	
C155	QFN41HJ-103	MY Cap	
C156	QET61CM-106	E Cap	
C157	QFN41HJ-563	MY Cap	
C158	QFN41HK-124	"	
C159	QET41CM-475	E Cap	
C169	QFN41HK-103	MY Cap	
C170	" -103	"	
C171	QCF11HP-223	C Cap	
BPF 1	PGZ00182	Band Pass Filter	
BPF 2	PU54410-2	"	
BPF 3	PGZ00191	"	
EQ 1	PU48515-5	Equilizer	
LPF 1	PGZ00181	Low Pass Filter	
LPF 2	"	"	
DL 1	PU46321-4A	Delay Line	
DL 2	PGZ00131-002	"	
△ X 1	PU57069	Crystal Osc.	
△ X 2	PU31449-4	Crystal	
L 1	PU48530-221J	Peaking Coil	
L 2	" -221J	"	
L 3	" -221J	"	
L 4	" -221J	"	
L 5	" -221J	"	
L 6	" -221J	"	
L 7	" -221J	"	
L 8	" -221J	"	
L 9	PU54710-822	Coil	
L10	PU48530-221J	Peaking Coil	
L11	" -221J	"	
L12	" -221J	"	
L13	" -221J	"	
L14	PU46398-2	Coil	
L15	PU46003-6R8	"	
L16	PU48530-221J	Peaking Coil	
L17	PGZ00121-102	"	
L18	PU48530-221J	"	
L19	" -221J	"	
L20	" -221J	"	
L21	" -221J	"	
L22	" -221J	"	

Symbol No.	Part No.	Part Name	Description
L23	PU48530-221JZ	Peaking Coil	
L24	" -221JZ	"	
L25	" -100KZ	Choke Coil	
L26	" -101KZ	Peaking Coil	
L27	" -221JZ	"	
L28	" -221JZ	"	
L29	" -221JZ	"	
L30	PGZ00121-102	"	
L31	-	Coil	
L32	PU30284-28R	Cap. Housing	
CN 1	PU43351-2		
CN 2	" -2		
CN 3	" -2		
CN 4	" -2		
CN 5	" -2		
CN 6	" -2		
CN 7	" -2		
CN 8	" -2		
CN 9	" -2		
CN 10	" -4		
CN 11	" -4		
CN 12	" -10		
CN 13	" -5		
CN 14	" -6		
CN 15	" -5		
CN 16	" -2		
CN 17	" -2		
CN 18	" -3		
CN 19	" -2		
CN 20	" -3		
	PU54983	Test Pin	TP2-26
	PGZ00150	TR Spacer	for Q5
	PU41624-6	Isolat Washer	"
	PU49485	Wire Clamp	"

6.2.11 Junction board ass'y 11 PGE30002B-01

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
IC 1	HD14021B	Integrated Circuit	or TC4021BP UPD4021BC	RA 1	EXB-P88104M	Resistor Array	100Ω 1W 1% 100V
IC 2	"	"	or " " "	RA 2	"	"	100Ω 1W 1% 100V
D 1	V03C	Diode		C 1	QET41AM-107	E Cap	0.01µF 100V
D 2	"	"		C 2	QET41CM-227	"	0.01µF 100V
DA 1	UPA64HA	Diode Array		C 3	" -227	"	0.01µF 100V
DA 2	UPA54HA	"		C 4	QCF11HP-472	C Cap	0.01µF 100V
				C 5	" -472	"	0.01µF 100V
				VA1~VA44	PU49624-2	Varistor	44 pcs.
R 1	QRD167J-103	CR		CN 1	PU49215-11Y	Cap. Housing	
R 2	" -103	"		CN 2	" -2	"	
R 3	" -103	"		CN 3	" -11R	"	
R 4	" -103	"		CN 4	" -12R	"	
R 5	" -103	"		CN 5	" -12Y	"	
R 6	" -103	"		CN 6	" -12	"	
R 7	" -103	"		CN 7	" -12	"	
R 8	" -103	"		CN 8	" -10	"	
R 9	" -103	"					
R10	" -103	"					
R11	" -103	"					
R12	" -103	"					
R13	" -103	"					
R14	" -103	"					
R15	" -103	"					
R16	" -103	"					
R17	" -101	"					
R18	" -101	"					
R19	" -101	"					
R20	" -101	"					
R21	" -101	"					
R22	" -101	"					
R23	" -101	"					
R24	" -101	"					
R25	" -101	"					
R26	" -101	"					
R27	" -101	"					
R28	" -101	"					
R29	" -101	"					
R30	" -101	"					
R31	" -101	"					
R32	" -101	"					
R33	" -101	"					
R34	" -101	"					
R35	" -101	"					
R36	" -104	"					

6.2.12 Y amp. board ass'y [1] [2] PGE10056A-04

Symbol No.	Part No.	Part Name	Description
IC 1	BA7021	Integrated Circuit	
IC 2	AN6306	"	
IC 3	BA7021	"	
IC 4	BA401	"	
IC 5	BA7021	"	
IC 6	"		
IC 7	"		
IC 8	"		
IC 9	5VT09	"	
IC10	AN6393	"	
IC11	AN6327	"	
IC12	BA7021	"	
IC13	"		
IC14	TL8704P	"	
IC15	T8004A	"	
IC16	AN608P	"	
Q 1	2SC2647C	Transistor	
Q 2	2SB641Q	"	
Q 3	2SC2647C	"	
Q 4	2SB641Q	"	
Q 5	2SC2647C	"	
Q 6	"		
Q 7	"		
Q 8	"		
Q 9	"		
Q10	"		
Q11	2SB641Q	"	
Q12	2SC2647C	"	
Q13	"		
Q14	"		
Q15	"		
Q16	2SB641Q	"	
Q17	"		
Q18	2SC2647C	"	
Q19	2SB641Q	"	
Q20	2SC2647C	"	
Q21	"		
Q22	2SB641Q	"	
Q23	2SC2647C	"	
Q24	2SB641Q	"	
Q25	2SC2647C	"	
Q26	2SB641Q	"	
Q27	2SC2647C	"	
Q28	"		
Q29	DTA144EF	D. Transistor	
Q30	2SB641Q	Transistor	
Q31	2SC2647C	"	
Q32	DTA144EF	D. Transistor	
Q33	2SC2647C	Transistor	
Q34	"		
Q35	"		
Q36	2SB641Q	"	
Q37	2SC2647C	"	
Q38	2SB641Q	"	
Q39	2SC2647C	"	
Q40	2SB641Q	"	
Q41	2SC2647C	"	
Q42	2SB641Q	"	
Q43	2SC2647C	"	
Q44	2SB641Q	"	
Q45	2SC2647C	"	

Symbol No.	Part No.	Part Name	Description
Q46	2SD638R	Transistor	
Q47	"	"	
Q48	2SC2647C	"	
Q49	"	"	
Q50	"	"	
Q51	2SC2647C	"	
Q53	"		
Q54	2SC2647C	Transistor	
Q55	"	"	
Q56	"	"	
Q57	"	"	
Q58	"	"	
Q59	"	"	
Q60	2SB641Q	"	
Q61	2SC2647C	"	
Q62	"	"	
Q63	"	"	
Q64	"	"	
Q65	2SC2647C	Transistor	
Q66	"	"	
Q67	DTA114EF	D. Transistor	
Q68	DTC114EF	"	
Q69	DTA114EF	"	
Q70	DTC114EF	"	
Q71	2SC2647C	Transistor	
Q72	"	"	
Q73	2SB643R	Transistor	
Q74	2SC2647C	"	
Q75	"	"	
Q76	2SC2647C	Transistor	
Q77	2SB641Q	"	
Q78	"	"	
Q79	2SC2647C	Transistor	
Q80	2SB643S	"	
Q81	"	"	
Q82	"	"	
D 1	1SS133	Diode	
D 2	RD3.3EB1	Zener Diode	
D 3	1SS99	Diode	
D 4	1SS133	"	
D 5	"	"	
D 6	1SS99	"	
D 7	"	"	
D 8	1SS133	"	
D 9	"	"	
D10	"	"	
D11	"	"	
D12	"	"	
D13	"	"	
D14	"	"	
D15	"	"	
D16	"	"	
D17	"		
D18	1SS133	Diode	
D19	1SS93	"	
D20	"	"	
D21	1SS133	"	
D22	"	"	
D23	"	"	
D24	1SS99	"	
D25	"	"	
D26	1SS133	"	
D27	"	"	
D28	"	"	
D29	"	"	
D30	1SS133	Diode	

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
D31	1SS133	Diode		R61	QRD161J-272	CR	
D32	OA90	"		R62	-	"	
D33	1SS133	"		R63	-	"	
R 1	QRD161J-393	CR		R64	QRD161J-152	CR	
R 2	" -183	"		R65	" -122	"	
R 3	" -224	"		R66	" -101	"	
R 4	" -391	"		R67	" -103	"	
R 5	" -331	"		R68	" -103	"	
R 6	" -561	"		R69	" -102	"	
R 7	" -563	"		R70	" -152	"	
R 8	QVZ3506-103	VR		R71	QRD167J-561	"	
R 9	QRD161J-152	CR		R72	QRD161J-331	"	
R10	" -682	"		R73	" -103	"	
R11	QVZ3506-103	VR		R74	" -103	"	
R12	QRD161J-562	CR		R75	" -102	"	
R13	" -152	"		R76	" -681	"	
R14	" -562	"		R77	" -103	"	
R15	" -222	"		R78	" -153	"	
R16	" -152	"		R79	" -102	"	
R17	" -272	"		R80	" -222	"	
R18	" -181	"		R81	" -153	"	
R19	-	-		R82	" -222	"	
R20	QRD161J-222	CR		R83	" -101	"	
R21	-	-		R84	" -102	"	
R22	QRD161J-682	CR		R85	QVZ3506-103	VR	
R23	-	-		R86	QRD161J-102	CR	
R24	QRD161J-272	CR		R87	" -222	"	
R25	QVZ3506-682	VR		R88	" -102	"	
R26	-	-		R89	" -152	"	
R27	QVZ3506-472	VR		R90	" -101	"	
R28	QRD161J-103	CR		R91	" -471	"	
R29	" -470	"		R92	" -820	"	
R30	" -822	"		R93	" -102	"	
R31	" -393	"		R94	" -271	"	
R32	QVZ3506-103	VR		R95	" -102	"	
R33	QRD161J-563	CR		R96	" -222	"	
R34	" -332	"		R97	" -102	"	
R35	" -102	"		R98	QVZ3506-102	VR	
R36	QVZ3506-102	VR		R99	QRD161J-561	CR	
R37	-	-		R100	" -222	"	
R38	QVZ3506-102	VR		R101	" -332	"	
R39	QRD161J-222	CR		R102	QVZ3506-102	VR	
R40	" -102	"		R103	QRD161J-103	CR	
R41	" -911	"		R104	" -681	"	
R42	" -561	"		R105	" -751	"	
R43	QVZ3506-102	VR		R106	" -102	"	
R44	QRD161J-102	CR		R107	-	-	
R45	" -181	"		R108	-	-	
R46	" -821	"		R109	-	-	
R47	" -750	"		R110	QRD161J-102	CR	
R48	QRD167J-561	"		R111	" -103	"	
R49	" -102	"		R112	" -103	"	
R50	" -102	"		R113	" -102	"	
R51	" -561	"		R114	" -103	"	
R52	" -911	"		R115	" -103	"	
R53	QVZ3506-102	VR		R116	" -100	"	
R54	QRD161J-391	CR		R117	" -222	"	
R55	" -103	"		R118	" -123	"	
R56	" -103	"		R119	" -393	"	
R57	" -472	"		R120	" -222	"	
R58	" -101	"		R121	" -561	"	
R59	" -272	"		R122	" -222	"	
R60	QVZ3506-331	VR		R123	" -103	"	
				R124	" -103	"	
				R125	" -103	"	

Symbol No.	Part No.	Part Name	Description
R126	QRD161J-122	CR	
R127	" -103	"	
R128	" -392	"	
R129	QRD167J-391	"	
R130	" -822	"	
R131	QRD161J-564	"	
R132	" -122	"	
R133	" -102	"	
R134	" -103	"	
R135	QRD163J-684	"	
R136	QVZ3506-102	VR	
R137	QRD161J-152	CR	
R138	" -102	"	
R139	" -152	"	
R140	" -331	"	
R141	" -122	"	
R142	" -561	"	
R143	-	-	
R144	QRD161J-393	CR	
R145	" -181	"	
R146	" -391	"	
R147	" -102	"	
R148	QVZ3506-102	VR	
R149	QRD161J-102	CR	
R150	" -911	"	
R151	" -561	"	
R152	QVZ3506-102	VR	
R153	QRD161J-272	CR	
R154	" -222	"	
R155	" -101	"	
R156	" -102	"	
R157	QVZ3506-223	VR	
R158	QRD161J-102	CR	
R159	QVZ3506-102	VR	
R160	QRD161J-102	CR	
R161	" -911	"	
R162	" -561	"	
R163	QVZ3506-102	VR	
R164	QRD161J-272	CR	
R165	" -750	"	
R166	" -222	"	
R167	" -102	"	
R168	" -101	"	
R169	" -102	"	
R170	QVZ3506-223	VR	
R171	QRD161J-103	CR	
R172	" -122	"	
R173	" -391	"	
R174	" -101	"	
R175	" -152	"	
R176	" -272	"	
R177	" -750	"	
R178	" -750	"	
R179	" -561	"	
R180	" -102	"	
R181	" -123	"	
R182	" -820	"	
R183	" -272	"	
R184	" -330	"	
R185	" -472	"	
R186	" -391	"	
R187	" -821	"	
R188	" -182	"	
R189	" -472	"	
R190	-	-	

Symbol No.	Part No.	Part Name	Description
R191	QRD161J-331	CR	
R192	" -185	"	
R193	" -272	"	
R194	" -272	"	
R195	" -103	"	
R196	" -473	"	
R197	-	-	
R198	-	-	
R199	QRD161J-104	"	
R200	" -222	"	
R201	" -222	"	
R202	" -102	"	
R203	-	-	
R204	-	-	
R205	QRD161J-681	CR	
R206	QVZ3506-222	VR	
R207	-	-	
R208	QRD161J-103	CR	
R209	" -681	"	
R210	" -102	"	
R211	QVZ3506-102	VR	
R212	QRD161J-222	CR	
R213	" -681	"	
R214	" -121	"	
R215	" -473	"	
R216	" -123	"	
R217	" -750	"	
R218	" -222	"	
R219	-	-	
R220	-	-	
R221	QRD161J-103	CR	
R222	" -103	"	
R223	QVZ3506-681	VR	
R224	" -222	"	
R225	QRD161J-101	CR	
R226	" -102	"	
R227	" -222	"	
R228	" -681	"	
R229	" -222	"	
R230	-	-	
R231	-	-	
R232	-	-	
R233	QVZ3506-102	VR	
R234	-	-	
R235	-	-	
R236	QRD161J-102	CR	
R237	" -272	"	
R238	" -103	"	
R239	" -101	"	
R240	-	-	
R241	QRD161J-103	CR	
R242	" -103	"	
R243	" -821	"	
R244	" -821	"	
R245	" -103	"	
R246	" -271	"	
R247	" -332	"	
R248	" -331	"	
R249	" -563	"	
R250	" -750	"	
R251	" -222	"	
R252	QRD167J-223	"	
R253	" -223	"	
R254	" -221	"	
R255	" -681	"	

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
R256	QRD167J-223	CR		C19	QET61EM-475	E Cap	
R257	" -223	"		C20	QCS31HJ-151	C Cap	
R258	" -223	"		C21	-	C Cap	
R259	" -223	"		C22	QCF31HP-103	C Cap	
R260	" -103	"		C23	QCS31HJ-820	"	
R261	" -223	"		C24	QET60JM-476	E Cap	
R262	" -123	"		C25	QCF31HP-223	C Cap	
R263	QRD161J-182	"		C26	QETA0JM-337	E Cap	
R264	" -102	"		C27	" -337	"	
R265	" -221	"		C28	QCF31HP-223	C Cap	
R266	" -223	"		C29	QET60JM-476	E Cap	
R267	" -223	"		C30	QETA0JM-337	"	
R268	" -393	"		C31	QCF31HP-223	C Cap	
R269	" -562	"		C32	QET60JM-476	E Cap	
R270	" -103	"		C33	QEN60JM-476	NP Cap	
R271	" -103	"		C34	QET60JM-476	E Cap	
R272	QRD167J-103	"		C35	" -476	"	
R273	-	-		C36	QCF31HP-223	C Cap	
R274	QRD167J-222	CR		C37	" -223	"	
R275	QRD161J-122	"		C38	QETA0JM-337	E Cap	
R276	QRD167J-822	"		C39	QCF31HP-223	C Cap	
R277	" -222	"		C40	QET61AM-476	E Cap	
R278	QRD161J-222	"		C41	QET60JM-476	"	
R279	" -222	"		C42	QET61CM-106	"	
R280	-	-		C43	" -106	"	
R281	QRD161J-221	CR		C44	QET61AM-476	"	
R282	" -471	"		C45	QCS31HJ-471	C Cap	
R283	" -151	"		C46	QET60JM-476	E Cap	
R284	" -271	"		C47	QCS31HJ-9R0	C Cap	
R285	" -471	"		C48	QETA0JM-337	E Cap	
R286	" -103	"		C49	QCF31HP-223	C Cap	
R287	" -471	"		C50	QFNA1HK-474	MY Cap	
R288	" -682	"		C51	QFN31HK-474	"	
R289	-	-		C52	QCF31HP-223	C Cap	
R290	-	-		C53	QET60JM-476	E Cap	
R291	-	-		C54	QETA0JM-227	"	
R292	-	-		C55	" -476	"	
R293	-	-		C56	QCS31HJ-100	C Cap	
R294	QRD161J-102	CR		C57	" -100	"	
R295	" -102	"		C58	QCF31HP-223	E Cap	
R296	-	-		C59	QET60JM-476	MY Cap	
R297	QRD161J-562	CR		C60	QFN31HK-474	E Cap	
R298	" -151	"		C61	" -476	"	
R299	" -471	"		C62	" -476	"	
R300	" -680	"		C63	QCF31HP-223	C Cap	
R301	" -391	"		C64	QET41AM-476	E Cap	
R302	" -392	"		C65	" -476	"	
R303	" -562	"		C66	QCS31HJ-220	C Cap	
R304	" -331	"		C67	" -220	"	
R305	" -183	"		C68	QET60JM-476	E Cap	
R306	" -103	"		C69	QCS31HJ-100	C Cap	
R307	" -101	"		C70	" -820	"	
R308	" -331	"		C71	QCF31HP-223	E Cap	
C 1	QET60JM-476	E Cap		C72	QET60JM-476	C Cap	
C 2	QCF31HP-223	C Cap		C73	QCS31HJ-330	E Cap	
C 3	QET60JM-476	E Cap		C74	QET60JM-476	C Cap	
C 4	" -476	"		C75	-	E Cap	
C 5	QET60CM-106	"		C76	QET60JM-476	"	
C 6	QET60JM-227	"		C77	QFN31HK-474	C Cap	
C 7	" -107	"		C78	QCF31HP-223	E Cap	
C 8	QFN31HK-224	MY Cap		C79	QET60JM-476	C Cap	
C 9	QET60HM-335	E Cap		C80	QCS31HJ-561	C Cap	
C 10	QCF31HP-103	C Cap		C81	QFN41HK-223	MY Cap	
C 11	QCS31HJ-121	"		C82	QCS31HJ-221	C Cap	
C 12	QCF31HP-103	"		C83	-	"	
C 13	QCS31HJ-390	"		C84	-	"	
C 14	QET61HM-105	E Cap		C85	-	"	
C 15	-	-		C86	QCF31HP-223	C Cap	
C 16	-	-		C87	" -223	"	
C 17	-	-		C88	QET60JM-476	E Cap	
C 18	QET61CM-106	E Cap		C89	QCF31HP-223	C Cap	
				C90	OAT3001-015.	TR Cap	

Symbol No.	Part No.	Part Name	Description
C91	QCT05CH-221	C Cap	
C92	" -150	"	
C93	QCS31HJ-101	"	
C94	" -101	"	
C95	QET60JM-476	E Cap	
C96	QCF31HP-223	C Cap	
C97	" -103	"	
C98	QCS31HJ-390	"	
C99	QCF31HP-223	"	
C100	QCS31HJ-560	"	
C101	QFN31HK-223	MY Cap	
C102	QCF31HP-223	C Cap	
C103	QFN31HK-153	MY Cap	
C104	QCS31HJ-470	C Cap	
C105	QFN31HK-153	MY Cap	
C106	QCS31HJ-330	C Cap	
C107	QCF31HP-223	"	
C108	QET60JM-476	E Cap	
C109	QCF31HP-223	C Cap	
C110	QET60JM-476	E Cap	
C111	QCF31HP-223	C Cap	
C112	QET60JM-476	E Cap	
C113	QCF31HP-223	C Cap	
C114	" -223	"	
C115	" -223	"	
C116	" -223	"	
C117	QCS31HJ-220	"	
C118	QFN31HK-222	MY Cap	
C119	QCF31HP-223	C Cap	
C120	" -223	"	
C121	" -103	"	
C122	" -103	"	
C123	-	-	
C124	QCT05CH-390	C Cap	
C125	QET61EM-475	E Cap	
C126	QET61CM-106	"	
C127	" -106	"	
C128	QCF31HP-103	C Cap	
C129	QCS11HJ-470	"	
C130	QET60JM-476	E Cap	
C131	QCF31HP-223	C Cap	
C132	QCS31HJ-560	"	
C133	" -390	"	
C134	" -8R0	"	
C135	QET60JM-476	E Cap	
C136	QCF31HP-223	C Cap	
C137	QEN60JM-106	NP Cap	
C138	QCS31HJ-391	C Cap	
C139	" -470	"	
C140	QETA0JM-337	E Cap	
C141	" -337	"	
C142	QET60JM-476	"	
C143	QCF31HP-223	C Cap	
C144	QCS31HJ-820	"	
C145	" -470	"	
C146	QET60JM-476	E Cap	
C147	QCS31HJ-470	C Cap	
C148	QET60JM-476	E Cap	
C149	QCF31HP-223	C Cap	
C150	QET60JM-476	E Cap	
C151	QCS31HJ-220	C Cap	
C152	QET60JM-476	E Cap	
C153	QCF31HP-223	C Cap	
C154	QET60JM-476	E Cap	
C155	" -476	"	
C156	QFN41HJ-474	"	
C157	QET40JM-228	"	
C158	QCS31HJ-270	C Cap	
C159	" -151	"	
C160	QET61CM-337	E Cap	
C161	QCF31HP-223	C Cap	
C162	QET61AM-336	E Cap	

Symbol No.	Part No.	Part Name	Description
C163	QET61CM-106	E Cap	
C164	" -337	"	
C165	QCF31HP-223	C Cap	
C166	QET61AM-476	E Cap	
C167	-	-	
C168	QET60JM-476	E Cap	
C169	" -476	"	
C170	" -476	"	
C171	QET61HM-475	"	
C172	-	-	
C173	QET61EM-475	E Cap	
C174	QCF31HP-223	C Cap	
C175	QET60JM-476	E Cap	
C176	QET61CM-106	"	
C177	QET60JM-476	"	
C178	" -476	"	
C179	" -476	"	
C180	QCF31HP-223	C Cap	
C181	-	-	
C182	QET60JM-476	E Cap	
C183	QCF31HP-223	C Cap	
C184	QET60JM-476	E Cap	
C185	QCS31HJ-330	C Cap	
C186	QET61AM-476	E Cap	
C187	QCF31HP-223	C Cap	
C188	QET60JM-476	E Cap	
C189	QCF31HP-223	C Cap	
C190	QET61AM-476	E Cap	
C191	QCF31HP-223	C Cap	
C192	QET61HM-105	E Cap	
C193	QET61CM-106	"	
C194	QCF31HP-103	C Cap	
C195	" -103	"	
C196	" -103	"	
C197	QFN31HK-104	MY Cap	
C198	QCF31HP-223	C Cap	
C199	QET61AM-476	E Cap	
C200	QET60JM-476	"	
C201	QET61CM-106	"	
C202	-	-	
C203	QET61HM-474	E Cap	
C204	QCF31HP-103	C Cap	
C205	" -103	"	
C206	" -103	"	
C207	" -223	"	
C208	QET60JM-476	E Cap	
C209	-	-	
C210	-	-	
C211	QET61AM-476	E Cap	
C212	QET61EM-475	C Cap	
C213	QET61HM-105	E Cap	
C214	QCF31HP-223	C Cap	
C215	QET60JM-107	E Cap	
C216	QCF31HP-223	C Cap	
C217	" -223	"	
C218	" -223	"	
C219	" -223	"	
C220	" -223	"	
C221	QCS31HJ-820	"	
C222	QCF31HP-223	"	
C223	" -223	"	
C224	QET61CM-476	E Cap	
C225	QETA0JM-227	"	
C226	-	-	
C227	QET61CM-476	E Cap	
C228	QET60JM-337	"	
C229	QET61CM-476	"	
C230	QCS31HJ-121	C Cap	
C231	QET61EM-475	E Cap	
C232	QET61EM-475	"	
C233	QETA0JM-337	"	
C234	-	-	

Symbol No.	Part No.	Part Name	Description
C235	QCS11HJ-181	C Cap	
C236	" -680	"	
C237	" -331	"	
C238	QET41CM-336	E Cap	
C239	QCS11HJ-560	C Cap	
C240	-	-	
C241	-	-	
C242	QCS11HJ-470	C Cap	
C243	QFN41HJ-103	MY Cap	
C244	QET41HM-105	E Cap	
C245	QET41CM-337	"	
C246	QCF11HP-223	C Cap	
C247	QCS11HJ-220	"	
C248	" -820	"	
C249	QET41AM-475	E Cap	
L 1	PU48530-221	Peaking Coil	
L 2	-	-	
L 3	-	-	
L 4	-	-	
L 5	PU48530-221J	Peaking Coil	
L 6	-	-	
L 7	PU48530-221J	Peaking Coil	
L 8	" -1R5K	"	
L 9	-	-	
L10	PU48530-221J	Peaking Coil	
L11	" -221J	"	
L12	" -820J	"	
L13	" -221J	"	
L14	" -221J	"	
L15	" -221J	"	
L16	" -470J	"	
L17	" -221J	"	
L18	" -560J	"	
L19	" -221J	"	
L20	-	-	
L21	PU48530-560K	Peaking Coil	
L22	" -221J	"	
L23	" -221J	"	
L24	" -221J	"	
L25	" -221J	"	
L26	" -221J	"	
L27	" -180J	"	
L28	" -221J	"	
L29	" -470J	"	
L30	" -270J	"	
L31	" -221J	"	
L32	" -221J	"	
L33	" -560J	"	
L34	" -101K	"	
L35	" -390J	"	
L36	" -3R3K	"	
L37	" -221J	"	
L38	" -101K	"	
L39	" -221J	"	
L40	" -221J	"	
L41	" -221J	"	
L42	" -221J	"	
L43	" -221J	"	
L44	" -221J	"	
L45	" -221J	"	
L46	" -221J	"	
L47	" -120J	"	
L48	" -221	"	

Symbol No.	Part No.	Part Name	Description
LPF 1	PGZ00183	Low Pass Filter	
LPF 2	PGZ00184	"	
LPF 3	PGZ00183	"	
LPF 4	PGZ00184	"	
LPF 5	PGZ00180	"	
X 1	PGZ00186	Crystal	
CT 1	PU46042-6	C. Trap	
CT 2	PGZ00133-443	"	
CT 3	PGZ00051	"	
CT 4	PU46042-6	"	
CT 5	" -5	"	
CT 6	PGZ00133-443	"	
CT 7	PU46042-6	"	
DL 1	PGZ00179-080	Delay Line	
CN 1	PU43351-2	Cap. Housing	
CN 2	" -2R	"	
CN 3	" -3	"	
CN 4	" -5Y	"	
CN 5	" -4Y	"	
CN 6	" -2R	"	
CN 7	" -2	"	
CN 8	" -2R	"	
CN 9	" -6	"	
CN 10	" -5	"	
CN 11	" -4	"	
CN 12	" -6Y	"	
CN 13	" -2	"	
CN 14	" -2Y	"	
CN 15	" -2Y	"	
CN 16	" -4	"	
CN 17	-	-	
CN 18	PU43351-5	Cap. Housing	
CN 19	" -3R	"	
PU54983	Test Pin	TP1-24	

6.2.13 End sensor board [1] [3]

Symbol No.	Part No.	Part Name	Description
	PGE40151	End Sensor Board	
▲	PT-352V	Photo Transistor	
▲	PU49624-2	Varistor	VA1
▲	" -2	"	VA2
	PU43351-100	Cap. Housing	

6.2.14 Operation board ①④

Symbol No.	Part No.	Part Name	Description
D 5	PGE30050-01-01	Operation board	
D 6	GL-3PR2	LED	
D 7	"	"	
D 8	"	"	
D 9	"	"	
D10	"	"	
D11	"	"	
D12	"	"	
D13	-	-	
D14	-	-	
D15	-	-	
D16	GL-3PR2	LED	
R 1	-	-	
R 2	-	-	
R 3	-	-	
R 4	-	-	
R 5	QRD182J-331	CR	
R 6	" -331	"	
R 7	" -331	"	
R 8	" -331	"	
R 9	" -331	"	
R10	" -331	"	
R11	" -331	"	
R12	" -331	"	
R13	-	-	
R14	-	-	
R15	-	-	
R16	QRD182J-331	CR	
S 5	PU49344	Switch	
S 6	"	"	
S 7	"	"	
S 8	"	"	
S 9	"	"	
S10	"	"	
S11	"	"	
S12	"	"	
S13	-	-	
S14	-	-	
S15	-	-	
S16	PU49344	Switch	
CN 1	PU49215-107	Cap. Housing	
CN 2	" -108R	"	
CN 3	" -109Y	"	
CN 4	" -109	"	
	PU52848-1-2	Spacer	x 9
	PGD40282	Spacer	x 9

6.2.15 LED board ①⑤

Symbol No.	Part No.	Part Name	Description
	PU55110	LED Board	
	GL-450V	LED	
	PQ30101A	LED Holder	

6.2.16 Counter board ass'y [1] [6] PGE30003B

Symbol No.	Part No.	Part Name	Description
IC 1	UPD554C-058	Integrated Circuit	
IC 2	UPD550C-055	"	
IC 3	TC4029BP	"	
Q 1	DTC124EF	D. Transistor	
Q 2	"	"	
Q 3	"	"	
Q 4	"	"	
Q 5	DTA124EF	"	
Q 6	"	"	
Q 7	2SB739BC	Transistor	
Q 8	DTC124EF	D. Transistor	
D 1	1SS133	Diode	
D 2	"	"	
D 3	RD5.6EB2	Zener Diode	
D 4	RD8.2EB2	"	
D 5	1SS133	Diode	
R 1	QRD167J-333	CR	
R 2	" -333	"	
R 3	" -104	"	
R 4	" -222	"	
R 5	" -222	"	
R 6	" -222	"	
R 7	" -333	"	
R 8	" -333	"	
R 9	" -104	"	
R10	" -104	"	
R11	" -105	"	
R12	" -103	"	
R13	" -104	"	
R14	" -332	"	
R15	" -333	"	
R16	" -104	"	
R17	" -104	"	
R18	" -105	"	
R19	" -333	"	
R20	" -563	"	
R21	" -391	"	
R22	" -333	"	
R23	" -333	"	
R24	" -473	"	
△ R25	ORZ0055-470	F.R	
R26	QRD167J-333	CR	
R27	" -102	"	
R28	" -103	"	
R29	" -333	"	

Symbol No.	Part No.	Part Name	Description
RA 1	EXB-P84104M	Resistor Array	
RA 2	EXB-P88334M	"	
RA 3	"	"	
C 1	QFN41HK-562	MY Cap	
C 2	QCS11HJ-471	C Cap	
C 3	" -121	"	
C 4	QCF11HP-473	"	
C 5	" -473	"	
C 6	QCS11HJ-471	"	
C 7	" -121	"	
C 8	QFN41HK-392	MY Cap	
C 9	" -392	"	
C10	QEK41HM-474	E Cap	
C11	QET41CM-227	"	
C12	" -477	"	
C13	" -106	"	
C14	" -106	"	
T 1	PGZ00002	Heater Trans.	
△ CF 1	PU50224	Ceramic Filter	
△ CF 2	"	"	
CN 1	PU43351-8	Cap. Housing	
CN 2	" -3R	"	

6.2.17 Cassette housing board [1] 8

Symbol No.	Part No.	Part Name	Description
	PGE40002	Cassette Housing Board	
	PT-352V	Photo Transistor	

6.2.18 V & FMA head board ass'y [1] 9 PGE40102A

Symbol No.	Part No.	Part Name	Description
CN 1	PU49215-106Y	Cap. Housing	
CN 2	" -106R	"	
CN 3	" -106	"	

6.2.19 Reel servo board ass'y [2] 0 PGE20040B

Symbol No.	Part No.	Part Name	Description
IC 1	UPC324C	Integrated Circuit	
IC 2	TC4066BP	"	
IC 3	TC4071BP	"	
IC 4	TC4069UBP	"	
IC 5	TA7140P	"	
IC 6	HA17555PS	"	
IC 7	M51207L	"	
IC 8	UPC324C	"	
IC 9	TC4066BP	"	
IC10	-	Integrated Circuit	
IC11	-	"	
IC12	M51207L	Integrated Circuit	
IC13	-	"	
IC14	TC4066BP	Integrated Circuit	
IC15	-	"	
IC16	TC4066BP	Integrated Circuit	
IC17	BA6302A	"	
IC18	UPC358C	"	
Q 1	2SD636R,S	Transistor	
Q 2	"	"	
Q 3	"	"	
Q 4	-	"	
Q 5	2SD636R,S	Transistor	
Q 6	2SB641R,S	"	
Q 7	2SD636R,S	"	
Q 8	-	"	
Q 9	2SD636R,S	Transistor	
Q10	2SB751Q	"	
Q11	2SD636R,S	"	
Q12	-	"	
Q13	-	"	
Q14	2SD636R,S	Transistor	
Q15	2SB751Q	"	
Q16	2SD636R,S	"	
Q17	-	"	
Q18	-	"	
Q19	-	"	
Q20	-	"	
Q21	-	"	
Q22	2SD837Q	Transistor	
Q23	"	"	
Q24	2SD636R,S	"	
Q25	"	"	
Q26	2SB641R,S	"	
Q27	2SD636R,S	"	
Q28	"	"	
Q29	"	"	
Q30	"	"	
Q31	"	"	
Q32	2SB641R,S	"	

REEL SERVO

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
D 1	1SS133	Diode		R41	QRD161J-103	CR	
D 2	"	"		R42	" -102	"	
D 3	"	"		R43	" -331	"	
D 4	U05E	"		R44	" -471	"	
D 5	"			R45	QVP4A0B-221	VR	
D 6	U05E	Diode		R46	QRD161J-561	CR	
D 7	"	"		R47	" -563	"	
D 8	"	"		R48	" -103	"	
D 9	"	"		R49	" -223	"	
D10	1SS133	Diode		R50	"	"	
D11	"	"		R51	QRD161J-224	CR	
D12	"	"		R52	" -473	"	
D13	"	"		R53	" -392	"	
RA 1	EXB-P85224M	Resistor Array		R54	" -223	"	
RA 2	"	"		R55	" -103	"	
R 1	QVP4A0B-102	VR		R56	" -103	"	
R 2	QRD161J-561	CR		R57	" -394	"	
R 3	" -103	"		R58	" -105	"	
R 4	" -103	"		R59	" -103	"	
R 5	" -333	"		R60	" -103	"	
R 6	" -103	"		R61	" -224	"	
R 7	" -124	"		R62	" -103	"	
R 8	" -472	"		R63	" -103	"	
R 9	" -682	"		R64	" -103	"	
R10	" -222	"		R65	" -562	"	
R11	" -104	"		R66	" -223	"	
R12	ORV143F-5361	MFR		R67	" -223	"	
R13	QRD161J-124	CR		R68	" -104	"	
R14	ORV143F-4641	MFR		R69	" -473	"	
R15	QRD161J-105	CR		R70	" -104	"	
R16	" -103	"		R71	" -103	"	
R17	QRD181J-224	"		R72	QVZ3501-102	VR	
R18	QRD161J-103	"		R73	QRD161J-122	CR	
R19	ORV143F-5361	MFR		R74	" -103	"	
R20	" -5361	"		R75	" -104	"	
R21	QRD161J-103	CR		R76	" -103	"	
R22	" -103	"		R77	"	"	
R23	"	"		R78	"	"	
R24	"	"		R79	"	"	
R25	"	"		R80	"	"	
R26	QRD161J-104	CR		R81	"	"	
R27	" -224	"		R82	"	"	
R28	" -472	"		R83	"	"	
R29	QVP4A0B-102	VR		R84	"	"	
R30	QRD161J-682	CR		R85	"	"	
R31	" -472	"		R86	"	"	
R32	QVP4A0B-102	VR		R87	"	"	
R33	QRD161J-472	CR		R88	"	"	
R34	QRD181J-103	"		R89	"	"	
R35	QRD161J-103	"		R90	"	"	
R36	" -473	"		R91	QRD161J-103	CR	
R37	" -104	"		R92	" -223	"	
R38	" -224	"		R93	" -103	"	
R39	" -103	"		R94	" -103	"	
R40	" -103	"		R95	" -394	"	

REEL SERVO

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
R106	QRD161J-473	CR		R171	QRD161J-472	CR	
R107	" -104	"		R172	" -563	"	
R108	" -103	"		R173	" -104	"	
R109	QVZ3501-102	VR		R174	" -104	"	
R110	QRD161J-122	CR		R175	" -224	"	
R111	" -103	"		R176	" -224	"	
R112	" -104	"		R177	" -823	"	
R113	" -103	"		R178	" -224	"	
R114	-	-		R179	" -103	"	
R115	-	-		R180	-	-	
R116	-	-		R181	-	-	
R117	-	-		R182	QRD161J-104	CR	
R118	-	-		R183	QVZ3501-104	VR	
R119	-	-		R184	-	-	
R120	-	-		R185	QRD161J-103	CR	
R121	-	-		R186	" -102	"	
R122	-	-		R187	" -102	"	
R123	-	-		R188	" -224	"	
R124	-	-		R189	" -154	"	
R125	-	-		R190	" -393	"	
R126	-	-		R191	" -104	"	
R127	-	-		R192	" -104	"	
R128	-	-		R193	" -103	"	
R129	-	-		R194	" -102	"	
R130	-	-		R195	" -224	"	
R131	-	-		R196	" -103	"	
R132	-	-		R197	" -104	"	
R133	-	-		R198	" -104	"	
R134	-	-		R199	" -153	"	
R135	QRD181J-103	CR		R200	" -184	"	
R136	QRD161J-103	"		R201	" -102	"	
R137	" -103	"		R202	" -153	"	
R138	" -472	"		C 1	QET41CM-107	E Cap	
R139	QVP4A0B-102	VR		C 2	QCF31HP-103	C Cap	
R140	QRD161J-682	CR		C 3	QET41HM-105	E Cap	
R141	QRD181J-472	"		C 4	QET61CM-106	"	
R142	QVZ3501-102	VR		C 5	QFN31HK-124	MY Cap	
R143	QRD161J-472	CR		C 6	QET41CM-106	E Cap	
R144	" -272	"		C 7	QFN31HK-123	MY Cap	
R145	QVP4A0B-102	VR		C 8	-	-	
R146	QRD161J-392	CR		C 9	QFN31HK-153	MY Cap	
R147	" -822	"		C 10	QET41CM-227	E Cap	
R148	" -333	"		C 11	" -227	"	
R149	-	-		C 12	" -106	"	
R150	QRX019J-R47S	MFR		C 13	QET61CM-106	"	
R151	QRD161J-822	CR		C 14	QET41CM-106	"	
R152	" -333	"		C 15	QFN31HK-473	MY Cap	
R153	-	-		C 16	QET61CM-106	E Cap	
R154	QRX019J-R47S	MFR		C 17	QFN41HK-103	MY Cap	
R155	QRD161J-223	CR		C 18	" -103	"	
R156	-	-		C 19	QET61CM-476	E Cap	
R157	-	-		C 20	QCF31HP-103	C Cap	
R158	-	-		C 21	QET61CM-106	E Cap	
R159	QRD121J-681	CR		C 22	QET41CM-106	"	
R160	-	-		C 23	QFN41HK-223	MY Cap	
R161	QRD181J-224	CR		C 24	QET61CM-106	E Cap	
R162	QRD161J-224	"		C 25	" -476	"	
R163	-	-					
R164	-	-					
R165	-	-					
R166	-	-					
R167	QVP4A0B-102	VR					
R168	QRD161J-103	CR					
R169	" -562	"					
R170	QVP4A0B-102	VR					

REEL SERVO

6.2.20 Capstan servo board ass'y 2 1 PGE20051A

Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
IC 1	UPC1458C	Integrated Circuit		D 1	1SS133	Diode	
IC 2	LM2907N-8			D 2	"	"	
IC 3	UPC1458C			D 3	"	"	
IC 4	UPC358C			D 4	"	"	
IC 5	UPC78M10H			D 5	"	"	
IC 6	AN360			D 6	"	"	
IC 7	LM2907N-8			D 7	"	"	
IC 8	TC4030BP			D 8	"	"	
IC 9	TC4011BP			D 9	"	"	
IC10	"			D10	"	"	
IC11	TC4027BP			D11	"	"	
IC12	HA17555PS			D12	RD4.7EB2	Zener Diode	
IC13	TC4555BP			D13	1SS133HV	Diode	
IC14	TC4017BP			D14	"	"	
IC15	HA17555PS			D15	"	"	
IC16	LM2907N-8			D16	1SS133	Diode	
IC17	UPC358C			D17	"	"	
IC18	AN6341N			D18	1SS99	"	
IC19	TC4066BP			D19	"	"	
IC20	UPC358C			RA 1	EXB-P85224M	Resistor Array	
IC21	TC4011BP			RA 2	"	"	
IC22	"			R 1	QRD167J-101	CR	
IC23	TC4066BP			R 2	" -103	"	
IC24	NJM2903D			R 3	QVP4A0B-103	VR	CAP FG AMP
				R 4	QRD167J-103	CR	BIAS
Q 1	2SD636R,S	Transistor		R 5	" -563	"	
Q 2	"			R 6	" -153	"	
Q 3	"			R 7	" -153	"	
Q 4	2SB641R,S			R 8	" -224	"	
Q 5	2SD636R,S			R 9	" -272	"	
Q 6	"			R10	" -472	"	
Q 7	"			R11	" -122	"	
Q 8	2SK30A-O	FET		R12	" -223	"	
Q 9	2SB641R,S	Transistor		R13	" -103	"	
Q10	2SC732BL			R14	QRV143F-1403	MFR	
Q11	2SD636R,S			R15	QRD167J-472	CR	
Q12	"			R16	QRV143F-1003	MFR	
Q13	"			R17	QRD167J-122	CR	
Q14	2SB641R,S			R18	QVP4A0B-102	VR	DRUM SEARCH F
Q15	2SD636R,S			R19	QRD167J-392	CR	
Q16	"			R20	QRV143F-5232	MFR	
Q17	"			R21	QRD167J-272	CR	
Q18	"			R22	QVP4A0B-102	VR	DRUM SEARCH.R
Q19	2SC1983R			R23	QRD167J-222	CR	
Q20	2SB751Q			R24	QRV143F-1002	MFR	
Q21	2SC1983R			R25	" -1072	"	
Q22	2SD639R,S			R26	QRD167J-103	CR	
Q23	"			R27	" -103	"	
Q24	2SC1983R			R28	" -103	"	
Q25	2SB751Q			R29	" -104	"	
Q26	2SC1983R			R30	" -224	"	
Q27	2SD639R,S			R31	" -154	"	
Q28	2SB641R,S			R32	" -153	"	
Q29	2SD636R,S			R33	" -221	"	
Q30	"			R34	" -102	"	
Q31	"			R35	" -104	"	
				R36	" -104	"	
				R37	" -105	"	
				R38	" -683	"	
				R39	" -272	"	
				R40	QVP4A0B-222	VR	CTL AMP BIAS

CAPSTAN SERVO

Symbol No.	Part No.	Part Name	Description
R41	QRD167J-562	CR	
R42	" -152	"	
R43	V44611-001	Bus Wire	
R44	QRD167J-103	CR	
R45	" -333	"	
R46	" -393	"	
R47	" -564	"	
R48	" -121	"	
R49	" -272	"	
R50	" -392	"	
R51	" -103	"	
R52	QRV143F-5623	MFR	
R53	" -1183	"	
R54	QRD167J-103	CR	
R55	QRV143F-1212	MFR	
R56	QRD167J-333	CR	
R57	QRV143F-6811	MFR	
R58	QRD167J-393	CR	
R59	" -102	"	
R60	" -332	"	
R61	" -103	"	
R62	QVP4A0B-222	VR	STILL WIDTH
R63	QRD167J-332	CR	
R64	" -223	"	
R65	" -104	"	
R66	" -104	"	
R67	" -473	"	
R68	" -104	"	
R69	" -103	"	
R70	" -104	"	
R71	" -103	"	
R72	" -473	"	
R73	" -104	"	
R74	" -223	"	
R75	QRD187J-333	"	
R76	QRD167J-472	"	
R77	" -472	"	
R78	" -224	"	
R79	-	"	
R80	QRD167J-332	CR	
R81	" -473	"	
R82	" -333	"	
R83	" -182	"	
R84	" -473	"	
R85	" -564	"	
R86	" -472	"	
R87	" -103	"	
R88	" -223	"	
R89	" -104	"	
R90	QVP4A0B-224	VR	
R91	QRD167J-394	CR	
R92	" -104	"	
R93	" -472	"	
R94	" -103	"	
R95	QRV143F-2433	MFR	
R96	QRD167J-103	CR	
R97	QRV143F-1653	MFR	
R98	" -1653	"	
R99	" -8252	"	
R100	QRD167J-104	CR	
R101	" -103	"	
R102	" -103	"	
R103	" -104	"	
R104	" -154	"	
R105	" -472	"	

Symbol No.	Part No.	Part Name	Description
R106	QVP4A0B-102	VR	CAP. DISCR.
R107	QRD167J-472	CR	
R108	" -474	"	
R109	" -223	"	
R110	" -104	"	
R111	" -473	"	
R112	QVZ3501-224	VR	SUB TRACKING
R113	QRD167J-224	CR	
R114	" -683	"	
R115	" -104	"	
R116	" -103	"	
R117	" -102	"	
R118	QRV143F-1802	MFR	
R119	QRD167J-102	CR	
R120	QRD187J-105	"	
R121	QRD167J-154	"	
R122	QRV143F-1272	MFR	
R123	" -1002	"	
R124	-	-	
R125	QRD167J-224	CR	
R126	QRV143F-5621	MFR	
R127	" -6041	"	
R128	QRD167J-222	CR	
R129	" -104	"	
R130	QRV143F-6811	MFR	
R131	" -3481	"	
R132	-	-	
R133	QRD167J-104	CR	
R134	" -332	"	
R135	" -103	"	
R136	" -273	"	
R137	" -223	"	
R138	" -223	"	
R139	" -104	"	
R140	" -103	"	
R141	" -103	"	
R142	" -103	"	
R143	" -105	"	
R144	" -563	"	
R145	" -473	"	
R146	" -104	"	
R147	QRZ0054-150	FR	
R148	QRD167J-222	CR	
R149	" -333	"	
R150	" -333	"	
R151	" -102	"	
R152	" -472	"	
R153	" -333	"	
R154	" -683	"	
R155	" -103	"	
R156	" -222	"	
R157	" -333	"	
R158	" -333	"	
R159	" -102	"	
R160	" -472	"	
R161	" -333	"	
R162	" -683	"	
R163	" -103	"	
R164	" -103	"	
R165	" -224	"	
R166	" -822	"	
R167	" -103	"	
R168	" -103	"	
R169	" -822	"	
R170	" -222	"	

CAPSTAN SERVO

Symbol No.	Part No.	Part Name	Description
R171	QRD167J-393	CR	
R172	" -104	"	
R173	" -104	"	
R174	" -103	"	
R175	" -224	"	
R176	" -183	"	
R187	" -103	"	
R178	" -103	"	
R179	" -123	"	
R180	" -473	"	
R181	" -222	"	
R182	" -154	"	
R183	" -104	"	
R184	QRV143F-8871	MFR	
R185	-	-	
R186	QRD167J-103	CR	
R187	-	-	
R188	QRD167J-104	CR	
R189	" -332	"	
R190	" -473	"	
R191	" -332	"	
R192	" -104	"	
R193	" -473	"	
R194	" -103	"	
R195	" -154	"	
R196	-	-	
R197	-	-	
R198	QRD167J-5611	CR	
R199	" -103	"	
R200	" -473	"	
R201	" -224	"	
R202	" -105	"	
R203	QRV143F-1502	MFR	
R204	QVZ3501-222	VR	
R205	QRD161J-103	CR	
R206	QRD167J-102	CR	
R207	" -102	"	
△ R208	PU52108-150K	Posistor	
△ R209	" -220K	"	
C 1	QET41CM-107	E Cap	
C 2	" -476	"	
C 3	QEE41CM-226	T Cap	
C 4	QET41CM-106	E Cap	
C 5	QEE41CM-226	T Cap	
C 6	QFP42AF-102M	PP Cap	
C 7	QFN41HK-104	MY Cap	
C 8	QET41CM-106	E Cap	
C 9	QFN41HK-472	MY Cap	
C10	QET41CM-106	E Cap	
C11	-	-	
C12	QEE41CM-106	T Cap	
C13	QFN41HK-104	MY Cap	
C14	" -103	"	
C15	QET41CM-106	E Cap	

Symbol No.	Part No.	Part Name	Description
C16	QET41CM-107	E Cap	
C17	QCF11HP-103	C Cap	
C18	QCS11HK-330	"	
C19	QET41CM-476	E Cap	
C20	QCF11HP-103	C Cap	
C21	QEE41CM-106	T Cap	
C22	-	-	
C23	QET41CM-107	E Cap	
C24	QEE41CM-106	T Cap	
C25	" -106	"	
C26	QET41CM-476	E Cap	
C27	QFN41HK-332	MY Cap	
C28	QEE41CM-106	T Cap	
C29	QCS11HK-471	C Cap	
C30	-	-	
C31	QEE41CM-226	T Cap	
C32	QFP42AF-162M	PP Cap	
C33	QFN41HK-104	MY Cap	
C34	QET41CM-106	E Cap	
C35	QFM41HJ-152M	MY Cap	
C36	QFN41HK-152	"	
C37	" -102	"	
C38	" -103	"	
C39	QCF11HP-103	C Cap	
C40	QET41EM-107	E Cap	
C41	" -476	"	
C42	QFN41HK-103	MY Cap	
C43	QFM41HJ-333M	"	
C44	QET41CM-476	E Cap	
C45	" -106	"	
C46	" -107	"	
C47	QFN41HK-102	MY Cap	
C48	QCF11HP-103	C Cap	
C49	QET41CM-107	E Cap	
C50	QFN41HK-103	MY Cap	
C51	QFM41HJ-183M	"	
C52	QFN41HK-333	"	
C53	QET41CM-107	E Cap	
C54	QCF11HP-103	C Cap	
C55	QEE41CM-226	T Cap	
C56	QFP42AF-272M	PP Cap	
C57	QFN41HK-333	MY Cap	
C58	QFP42AF-122M	PP Cap	
C59	" -122M	"	
C60	" -242M	"	
C61	QET41CM-106	E Cap	
C62	QFN41HK-472	MY Cap	
C63	QET41CM-106	E Cap	
C64	QFN41HK-102	MY Cap	
C65	QFM41HJ-563M	"	
C66	QFN41HK-332	"	
C67	QFP42AF-154M	PP Cap	
C68	QFN41HK-104	MY Cap	
C69	QEE41CM-106	T Cap	
C70	QET41CM-227	E Cap	
C71	QCF11HP-103	C Cap	
C72	-	-	
C73	QET41EM-476	E Cap	
C74	QCF11HP-103	C Cap	
C75	QEE41EM-475	T Cap	
C76	" -475	"	
C77	QFN41HK-103	MY Cap	
C78	QCF11HP-102	C Cap	
C79	QET41HM-475	E Cap	
C80	QCF11HP-102	C Cap	

6.2.21 Drum servo board ass'y 22 . . . PGE20084B-01

Symbol No.	Part No.	Part Name	Description
C81	QET41HM-475	E Cap	
C82	QET41CM-476	"	
C83	QCF11HP-1O3	C Cap	
C84	QET41CM-1O7	E Cap	
C85	QCF11HP-1O3	C Cap	
C86	QET41EM-1O7	E Cap	
C87	-	-	
C88	QET41CM-1O6	E Cap	
C89	QFN41HK-152	MY Cap	
C90	QET41CM-476	E Cap	
C91	QFN41HK-1O3	MY Cap	
C92	" -103	"	
C93	" -393	"	
C94	QCF11HP-223	C Cap	
C95	QFM41HJ-222M	MY Cap	
C96	QET41CM-1O6	E Cap	
L 1	PU48530-271K	Peaking Coil	
L 2	" -271K	"	
L 3	-	-	
L 4	PU48530-271K	Peaking Coil	
L 5	" -271K	"	
L 6	" -271K	"	
L 7	" -271K	"	
L 8	" -271K	"	
L 9	" -271K	"	
J211	PU50715-6	Connector	
J212	" -20	"	
J213	" -20	"	
	PU45908	Test Pin	TP1-27
	PU32908 GBST3006ZS	Servo Board Stay Screw	x 2

Symbol No.	Part No.	Part Name	Description
IC 1	UPC7812H	Integrated Circuit	
IC 2	M51490L	"	
IC 3	UPC78M05H	"	
IC 4	TC4011BP	"	
IC 5	MN50005JVE	"	
IC 6	TC4011BP	"	
IC 7	AN6342N	"	
IC 8	UPC1458C	"	
IC 9	M51490L	"	
IC10	TC4538BP	"	
IC11	HA17555PS	"	
IC12	TA78009AP	"	
IC13	AN6671K	"	
IC14	AN6344	"	
IC15	TC4066BP	"	
IC16	"	"	
IC17	UPC1458C	"	
IC18	TC4069UBP	"	
IC19	TC4001BP	"	
IC20	NJM2903D	"	
Q 1	2SC1545B	Transistor	
Q 2	2SD636R,S	"	
Q 3	2SC1545B	"	
Q 4	DTC124EF	D. Transistor	
Q 5	"	"	
Q 6	2SD636R,S	Transistor	
Q 7	"	"	
Q 8	"	"	
Q 9	"	"	
Q10	"	"	
Q11	2SB641R,S	"	
Q12	2SD636R,S	"	
Q13	DTC124EF	D. Transistor	
Q14	"	"	
Q15	"	"	
Q16	2SB641R,S	Transistor	
Q17	2SD636R,S	"	
Q18	2SA1020	"	
Q19	2SB641R,S	"	
Q20	2SD636R,S	"	
Q21	"	"	
Q22	2SK30A-O	FET	
Q23	"	"	
Q24	2SD636R,S	Transistor	
Q25	"	"	
Q26	DTC144EF	D. Transistor	
Q27	DTA144EF	"	
D 1	1SS133	Diode	
D 2	1SS99	"	
D 3	1SS133	"	
D 4	"	"	
D 5	"	"	
D 6	"	"	
D 7	"	"	
D 8	"	"	

DRUM SERVO

Symbol No.	Part No.	Part Name	Description
D 9	1SS133	Diode	
D10	"	"	
D11	"	"	
D12	1SS99	"	
D13	1SS133	"	
D14	"	"	
D15	"	"	
D16	"	"	
D17	11DQ04FA-8	"	
D18	1SS133	"	
D19	"		
D20	1SS133	Diode	
D21	"	"	
D22	"	"	
D23	"	"	
D24	"	"	
D25	"	"	
D26	"	"	
R 1	QRD167J-473	CR	
R 2	" -104	"	
▲ R 3	PU52108-1R0	Posistor	
R 4	QRD167J-104	CR	
R 5	" -222	"	
R 6	" -152	"	
R 7	" -224	"	
R 8	" -563	"	
R 9	" -223	"	
R10	" -153	"	
R11	" -473	"	
R12	" -153	"	
R13	" -104	"	
R14	" -563	"	
R15	" -223	"	
R16	" -563	"	
R17	" -153	"	
R18	" -103	"	
R19	" -393	"	
R20	" -682	"	
R21	" -682	"	
R22	" -153	"	
R23	" -153	"	
R24	" -102	"	
R25	" -103	"	
R26	" -103	"	
R27	" -563	"	
R28	" -104	"	
R29	" -473	"	
R30	" -104	"	
R31	" -223	"	
R32	" -473	"	
R33	" -563	"	
R34	" -223	"	
R35	" -103	"	
R36	" -563	"	
R37	" -473	"	
R38	" -103	"	
R39	" -473	"	
R40	" -223	"	
R41	" -332	"	
R42	" -562	"	
R43	" -563	"	
R44	" -472	"	
R45	" -221	"	

Symbol No.	Part No.	Part Name	Description
R46	QRD167J-104	CR	
R47	" -393	"	
R48	" -393	"	
R49	" -393	"	
R50	" -472	"	
R51	" -332	"	
R52	QVP9A0B-473	VR	
R53	QRD167J-472	CR	
R54	" -390	"	
R55	" -390	"	
R56	" -104	"	
R57	" -222	"	
R58	" -152	"	
R59	" -224	"	
R60	" -103	"	
R61	" -223	"	
R62	" -223	"	
R63	" -102	"	
R64	" -472	"	
R65	" -103	"	
R66	" -103	"	
R67	" -103	"	
R68	"		
R69	QRD167J-224	CR	
R70	" -273	"	
R71	" -102	"	
R72	" -104	"	
R73	" -223	"	
R74	" -154	"	
R75	" -104	"	
R76	" -223	"	
R77	" -104	"	
R78	" -103	"	
R79	" -103	"	
R80	" -104	"	
R81	" -224	"	
R82	" -222	"	
R83	" -222	"	
R84	" -104	"	
R85	" -682	"	
R86	" -474	"	
R87	" -105	"	
R88	" -102	"	
R89	" -102	"	
R90	" -102	"	
R91	" -102	"	
R92	" -473	"	
R93	" -223	"	
R94	" -561	"	
R95	" -222	"	
R96	" -102	"	
R97	" -222	"	
R98	" -333	"	
R99	" -682	"	
R100	" -821	"	
R101	QRX019J-8R2	MFR	
R102	QRD167J-222	CR	
R103	" -222	"	
R104	" -331	"	
R105	" -103	"	
R106	" -103	"	
R107	" -104	"	
R108	" -103	"	
R109	" -103	"	
R110	" -823	"	

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Symbol No.	Part No.	Part Name	Description	Symbol No.	Part No.	Part Name	Description
R111	QRD167J-224	CR		R176	QRD167J-103	CR	
R112	" -102	"		R177	QRV143F-1302	MFR	
R113	" -823	"		R178	QRD167J-103	CR	
R114	" -103	"		R179	" -103	"	
R115	" -272	"		R180	" -123	"	
R116	" -271	"		R181	" -153	"	
R117	" -103	"		R182	" -103	"	
R118	" -394	"		R183	QRD161J-103	"	
R119	" -472	"		R184	" -103	"	
R120	" -105	"		R185	" -224	"	
R121	" -564	"		R186	" -184	"	
R122	" -105	"		R187	" -104	"	
R123	QVP9A0B-104	VR		R188	" -224	"	
R124	QRD167J-223	CR		C 1	QET41EM-107	E Cap	
R125	QVP9A0B-104	VR		C 2	QCF11HP-103	C Cap	
R126	QRD167J-223	CR		C 3	QET41CM-476	E Cap	
R127	QVP9A0B-154	VR		C 4	QET41CM-476	"	
R128	QRD167J-223	CR		C 5	QCS11HJ-151	C Cap	
R129	" -394	"		C 6	QFN41HK-103	MY Cap	
R130	" -474	"		C 7	QVF41HJ-474M	TF Cap	
R131	QRV143F-4322	MFR		C 8	QCF11HP-103	C Cap	
R132	QRD167J-101	CR		C 9	QET41CM-227	E Cap	
R133	QRV143F-4121	MFR		C 10	QET41EM-227	"	
R134	" -6192	"		C 11	QCF11HP-103	C Cap	
R135	QVP9A0B-682	VR		C 12	QET41CM-227	E Cap	
R136	QRV143F-4641	MFR		C 13	QCF11HP-103	C Cap	
R137	" -3481	"		C 14	QFN41HK-103	MY Cap	
R138	QRD167J-564	CR		C 15	QET41HM-105	E Cap	
R139	" -1224	"		C 16	QET41CM-107	"	
R140	" -105	"		C 17	" -227	"	
R141	" -102	"		C 18	QFN41HK-104	MY Cap	
R142	QVP9A0B-102	VR		C 19	QCS11HJ-330	C Cap	
R143	QRD167J-562	CR		C 20	" -330	"	
R144	QRV143F-1003	MFR		C 21	QFN41HK-152	MY Cap	
R145	QRD167J-683	CR		C 22	QCS11HJ-561	C Cap	
R146	-	-		C 23	QFP42AF-102M	PP Cap	
R147	-	-		C 24	QET41HM-105	E Cap	
R148	-	-		C 25	QET41HM-105	"	
R149	-	-		C 26	QET41CM-227	"	
R150	QRD167J-103	CR		C 27	QCF11HP-103	C Cap	
R151	" -103	"		C 28	QCS11HJ-471	"	
R152	" -103	"		C 29	QET41CM-227	E Cap	
R153	" -472	"		C 30	QCF11HP-103	C Cap	
R154	" -103	"		C 31	QCS11HJ-101	"	
R155	" -103	"		C 32	QFN41HK-103	MY Cap	
R156	" -474	"		C 33	QCS11HJ-150	C Cap	
R157	" -104	"		C 34	QET41CM-227	E Cap	
R158	QRV143F-3573	MFR		C 35	QCF11HP-103	C Cap	
R159	" -1783	"		C 36	QCS11HJ-101	"	
R160	" -3573	"		C 37	" -101	"	
R161	QRD167J-333	CR		C 38	QET41CM-336	E Cap	
R162	" -103	"		C 39	QET41EM-106	"	
R163	" -222	"		C 40	" -106	"	
R164	" -103	"		C 41	QCF11HP-223	C Cap	
R165	" -182	"		C 42	QET41CM-476	E Cap	
R166	" -330	"		C 43	" -476	"	
R167	" -821	"		C 44	QCS11HJ-151	C Cap	
R168	" -183	"		C 45	QFN41HK-103	MY Cap	
R169	" -562	"		C 46	QVF41HJ-474M	TF Cap	
R170	" -222	"		C 47	QET41HM-105	E Cap	
R171	" -470	"		C 48	QFN41HK-103	MY Cap	
R172	" -821	"		C 49	" -102	"	
R173	" -103	"		C 50	QFM41HJ-104M	"	
R174	" -391	"					
R175	" -332	"					

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Symbol No.	Part No.	Part Name	Description
C51	QFN41HK-103	"	
C52	QET41CM-227	E Cap	
C53	QCF11HP-103	C Cap	
C54	QFN41HK-103	MY Cap	
C55	QFN41HK-104	"	
C56	QFN41HK-222	MY Cap	
C57	QFM41HJ-104M	"	
C58	QET41CM-107	E Cap	
C59	QCF11HP-103	C Cap	
C60	QET41EM-106	E Cap	
C61	QFN41HK-223	MY Cap	
C62	" -473	"	
C63	QER41HM-225	E Cap	
C64	" -225	"	
C65	QFN41HK-333	MY Cap	
C66	QFZ9011-104	MP Cap	
C67	QER41HM-225	E Cap	
C68	QER41HM-225	"	
C69	QET41EM-107	"	
C70	QET41EM-107	"	
C71	QFN41HK-223	MY Cap	
C72	QFZ9011-104	MP Cap	
C73	QET41EM-107	E Cap	
C74	QET41CM-107	"	
C75	QCF11HP-103	C Cap	
C76	QET41HM-105	E Cap	
C77	QFN41HK-103	MY Cap	
C78	QFM41HJ-104M	"	
C79	QET4THM-105	E Cap	
C80	QET41HM-105	"	
C81	QFM41HJ-393M	MY Cap	
C82	QFM41HJ-393M	"	
C83	QFM41HJ-103M	"	
C84	QCS11HJ-330	C Cap	
C85	QFP42AF-273M	PP Cap	
C86	QFM41HJ-223M	MY Cap	
C87	QET41CM-227	E Cap	
C88	QCF11HP-103	C Cap	
C89	QFN41HK-104	MY Cap	
C90	QCF11HP-103	C Cap	
C91	QET41CM-337	E Cap	
C92	QFN41HK-104	MY Cap	
C93	QFP42AF-103M	PP Cap	
C94	QFM41HJ-103M	MY Cap	
C95	QFP42AF-183M	PP Cap	
C96	QCF11HP-223	C Cap	
C97	QEE41CM-106	T Cap	
C98	QET41CM-227	E Cap	
C99	QCF11HP-103	C Cap	
C100	QEE41CM-106	T Cap	
C101	QEE41CM-106	"	
C102	QFN41HK-124	MY Cap	
C103	QFP42AF-183M	PP Cap	
C104	QFP42AF-183M	"	
C105	QFP42AF-363M	"	
C106	QET41CM-227	E Cap	
C107	QCF11HP-103	C Cap	
C108	QET41HM-105	E Cap	
C109	QET41EM-475	"	
C110	QET41HM-105	"	
C111	QET41EM-475	"	
C112	QET41HM-105	"	
C113	QFN41HK-223	MY Cap	
C114	QEE41CM-475	TAN Cap	

Symbol No.	Part No.	Part Name	Description
L 1	PU48530-271K	Peaking Coil	
L 2	" -271K	"	
L 3	" -271K	"	
L 4	" -271K	"	
L 5	" -271K	"	
L 6	PU49994-120	"	
L 7	PU55811-391	Coil	
L 8	PU30284-51R	Choke Coil	
L 9	PU48530-221K	Peaking Coil	
L10	" -271K	"	
L11	" -271K	"	
L12	" -271K	"	
CN 7	PU50715-17	Cap. Housing	
CN 8	" -14	"	
CN 9	" -14	"	
AX 1	PU31449-2	Crystal	
ACF 1	PU55407	Ceramic Filter	
SW 1	PU49847	Slide Switch	
	PU45908	Test Pin	TP3, 4, 14, 18, 33, 34
	PU57545	"	TP1, 2, 5-13, 15-17, 19-32
	PU32908	Servo Board Stay	
	GBST3006Z	Screw	x2
	PGD30411	Shield Case	
	PGD30412	"	
	PGD30413	"	

6.2.22 Mother board ass'y [2] [3] PGE20115A

Symbol No.	Part No.	Part Name	Description
△CN 1	PU50714-6	Cap. Housing	
△CN 2	" -18	"	
△CN 3	" -16	"	
△CN 4	" -18	"	
△CN 5	" -18	"	
△CN 6	" -6	"	
△CN 7	" -17	"	
△CN 8	" -14	"	
△CN 9	" -14	"	
CN10	-	-	
CN11	-	-	
CN12	-	-	
CN13	-	-	
CN14	-	-	
△CN15	PU43351-9	Cap. Housing	
△CN16	" -2Y	"	
△CN17	" -2	"	
△CN18	" -2R	"	
△CN19	" -3	"	
△CN20	" -3Y	"	
△CN21	" -5	"	
△CN22	" -5R	"	
△CN23	" -5	"	
△CN24	" -4	"	
△CN25	" -2	"	
△CN26	" -2R	"	
△CN27	" -3Y	"	
△CN28	" -3	"	
△CN29	" -2	"	
△CN30	" -2Y	"	
		Mother Board Stay	x 2
		Board Guide	x 2
		Tapping Screw	x 4
		Screw	x 4
		Board Holder	x 2

6.2.24 Front LED board [2] [5] PGE20115A

Symbol No.	Part No.	Part Name	Description
	PGE40097-01-01	Front LED Board	
D 1	GL-9NG2	LED	
D 2	GL-9PR2	"	
D 3	GL-9NG2	"	
R 1	QRD167J-102	CR	
R 2	" -821	"	
R 3	" -102	"	
	PU50634-2	LED Spacer	x 3

6.2.25 Rear-2 board [2] [6] PGE30074A

Symbol No.	Part No.	Part Name	Description
R 1	QRD161J-101	CR	
R 2	" -101	"	
	PGZ00173	Connector	7-pin
	PGZ00174	"	7-pin

6.2.26 LD/UNLD SW board [2] [7] PGE40069-1-1

Symbol No.	Part No.	Part Name	Description
	PGE40069-1-1	LD/UNLD SW board	

6.2.27 Photo interrupter (TU reel FG) board [2] [8] PU55701

Symbol No.	Part No.	Part Name	Description
C 1	PU55701	Photo Interrupter	
	QCF11HP-223	C Cap	

6.2.23 Search VR board [2] [4] PGE40105

Symbol No.	Part No.	Part Name	Description
	PGE40105	Search VR Board	
	PGZ00001-3	Search VR	
	PU43351-106	Cap. Housing	
	QVZ3531-472	VR	

6.2.28 Photo interrupter (Supply reel FG) board [2] [9] PU55701

Symbol No.	Part No.	Part Name	Description
C 1	PU55701	Photo Interrupter	
	QCF11HP-223	C Cap	

6.2.29 Jack board [3] 0

Symbol No.	Part No.	Part Name	Description
	PGE40094-01-01	Jack Board	
	PU51574	Mic Jack	x 2
	PU51575	Headphone Jack	
	PGZ00406	VR	
CN 4	PU43351-6	Cap. Housing	
CN 5	" -106	"	

6.2.33 A/C head board ass'y [3] 5 PGZ00271

Symbol No.	Part No.	Part Name	Description
R 1	QRD167J-100	CR	
R 2	" -100	"	
	PU49215-104	Cap. Housing	

6.2.30 Display board ass'y [3] 2 PGE30003A2

Symbol No.	Part No.	Part Name	Description
	PU50660-2	FDP	
	PU50515	Display Holder	
	SDSA2608Z	Screw	x 2
S 1	PGZ00029	Push Switch	
S 2	"	"	

6.2.34 Pickup detector board [3] 8

Symbol No.	Part No.	Part Name	Description
	PGE40012	Pickout Detector Board	
	PU50576	Photo Interrupter	

6.2.31 VR board (2) ass'y [3] 3 PGE30049A2

Symbol No.	Part No.	Part Name	Description
R 4	QRD121J-151	CR	
R 8	PGZ00023-001	VR	
R10	PGZ00023-001	VR	

6.2.35 Hour meter board [4] 0

Symbol No.	Part No.	Part Name	Description
	PGE40099-01-01	Hour Meter Board	
R 1	QRD167J-183	CR	
R 2	" -392	"	
R 3	" -274	"	
	PU44398	Fuse Socket	x 2

6.2.32 VR board (3) ass'y [3] 4 PGE30049A3

Symbol No.	Part No.	Part Name	Description
S 1	PU50638	Rotary Switch	
CN16	PU43351-3	Cap. Housing	
CN17	" -3Y	"	
	PGD40419	Guard	

6.2.36 Power transistor board [4] 1

Symbol No.	Part No.	Part Name	Description
	PGE40014-1-1	Power Transistor Board	
IC 1	STK5730	Hybrid I.C.	
△R 1	QRD167J-222	CR	
△C 1	OET41CM-337	E Cap	

6.2.37 Audio sub board ass'y [4] [2] PGE30075A-01

Symbol No.	Part No.	Part Name	Description
IC 1	TC4066BP	Integrated Circuit	
IC 2	M5218P	"	
Q 1	2SD973AR	Transistor	
R 1	QRD167J-103	CR	
R 2	" -103	"	
R 3	" -122	"	
R 4	" -122	"	
R 5	" -124	"	
R 6	" -124	"	
R 7	-	-	
R 8	QRD167J-392	CR	
R 9	" -392	"	
R10	QRX019J-151S	MFR	
R11	QRD167J-561	CR	
C 1	QEN41HM-225	NP Cap	
C 2	" -225	"	
C 3	QET41CM-337	E Cap	
C 4	QET41EM-475	"	
C 5	QET41CM-477	"	
C 6	" -476	"	
B 1	QRD167J-102	CR	
CN 1	PU43351-4Y	Cap. Housing	
CN 2	" -3R	"	
CN 3	" -3	"	
CN 4	" -2	"	
	PU56008	Test Pin	TP1

6.2.39 Color frame servo board ass'y [6] [3] PGE20105A-01

Symbol No.	Part No.	Part Name	Description
IC 1	BA401	Integrated Circuit	
IC 2	TC4584BP	"	
IC 3	BU4001B	"	
IC 4	TC4015BP	"	
IC 5	TC4069UBP	"	
IC 6	TC4013BP	"	
IC 7	TC4538BP	"	
IC 8	TC4017BP	"	
IC 9	MN50005JVE	"	
IC10	TC74HC4040P	"	
IC11	TC4040BP	"	
IC12	TC4085BP	"	
IC13	TC4071BP	"	
IC14	BU4001B	"	
IC15	TC4015BP	"	
Q 1	DTC124EF	D..Transistor	
Q 2	2SD636R,S	Transistor	
Q 3	DTC124EF	D. Transistor	
Q 4	2SB641R,S	Transistor	
D 1	1SS133	Diode	
D 2	"	"	
D 3	"	"	
D 4	"	"	
R 1	QRD167J-682	CR	
R 2	" -103	"	
R 3	" -103	"	
R 4	QRV143F-3012	MFR	
R 5	QRD167J-103	CR	
R 6	" -823	"	
R 7	-	-	
R 8	-	-	
R 9	QRD167J-222	CR	
R10	" -103	"	
R11	" -153	"	
R12	" -682	"	
R13	QRV187F-4222	MFR	
R14	QRD167J-222	CR	
R15	" -104	"	
R16	" -154	"	
R17	" -100	"	
R18	" -100	"	
R19	" -154	"	
R20	" -102	"	
R21	" -102	"	
R22	" -823	"	
R23	" -102	"	
R24	" -104	"	
R25	-	-	

6.2.38 C/F sub board ass'y [4] [6] PGE40149A

Symbol No.	Part No.	Part Name	Description
IC 1	TC4011BP	Integrated Circuit	
IC 2	TC4013BP	"	
Q 1	2SC2647C	Transistor	
Q 2	DTC144EF	D. Transistor	
Q 3	"	"	
Q 4	"	"	
D 1	1SS133	Diode	
R 1	QRD167J-333	CR	
R 2	" -104	"	
R 3	" -223	"	
R 4	" -273	"	
R 5	" -104	"	
R 6	" -223	"	
R 7	" -223	"	
C 1	QCF11HP-223	C Cap	
C 2	" -223	"	
CN1	PU43351-4	Cap. Housing	
	DPSP3008Z	Screw	
	NNS3000N	Nut	

COLOR FRAME SERVO

Symbol No.	Part No.	Part Name	Description
R26	QRD167J-154	CR	Capacitor
R27	" -124	"	"
R28	" -102	"	"
R29	" -334	"	"
R30	QRV143F-2002	MFR	Module
R31	QRD167J-222	CR	Capacitor
R32	" -820	"	"
R33	" -472	"	"
R34	" -104	"	"
R35	" -153	"	"
R36	" -102	"	"
R37	" -474	"	"
R38	" -100	"	"
R39	" -100	"	"
R40	" -100	"	"
R41	" -153	"	"
RA 1	EXB-P85104M	Resistor Array	Resistor
RA 2	"	"	"
C 1	QCF11HP-473	C Cap	Capacitor
C 2	" -473	"	"
C 3	" -473	"	"
C 4	" -473	"	"
C 5	QET41CM-227	E Cap	Capacitor
C 6	QEN41EM-475	NP Cap	Capacitor
C 7	QET41CM-107	E Cap	Capacitor
C 8	QCF11HP-223	C Cap	Capacitor
C 9	QET41HM-105	E Cap	Capacitor
C10	QCF11HP-223	C Cap	Capacitor
C11	QFP42AF-102	PP Cap	Capacitor
C12	QCS11HJ-151	C Cap	Capacitor
C13	QET41HM-105	E Cap	Capacitor
C14	QET41CM-476	"	"
C15	QCF11HP-223	C Cap	Capacitor
C16	QCT05HH-330	"	"
C17	" -330	"	"
C18	QCS11HJ-561	"	"
C19	QFN41HJ-152	MY Cap	Capacitor
C20	QFP42AF-102	PP Cap	Capacitor
C21	QCF11HP-223	C Cap	Capacitor
C22	" -223	"	"
C23	QFN41HJ-103	MY Cap	Capacitor
C24	" -103	"	"
C25	QCF11HP-223	C Cap	Capacitor
C26	" -223	"	"
C27	" -223	"	"
C28	" -223	"	"
C29	" -223	"	"
C30	" -223	"	"
C31	" -223	"	"
C32	" -223	"	"
C33	" -223	"	"
C34	" -223	"	"
C35	" -223	"	"
C36	" -223	"	"
C37	QET41CM-107	E Cap	Capacitor
C38	" -107	"	"

Symbol No.	Part No.	Part Name	Description
L 1	PU48530-221K	Peaking Coil	Coil
L 2	" -221K	"	"
L 3	" -221K	"	"
△ CF 1	PU55407	Ceramic Filter	Filter
CN 1	PU433514R	Cap. Housing	Housing
CN 2	" -10	"	"
CN 3	" -2R	"	"
CN 4	" -2Y	"	"
CN 5	" -3Y	"	"
CN 6	" -4	"	"
CN 7	" -2	"	"
CN 8	" -3	"	"
PGZ00354	Ferrite Beads	K1-K4	
PU54983	Test Pin	TP1-14	